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Bulletin

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JUST OUT

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DIFFERENTIAL DIAGNOSIS OF DISEASES OF THE MEDIASTINUM*

JOHN PHILLIPS, M.B.
CLEVELAND

The various affections of the mediastinum are so frequently associated with pulmonary disease, and the symptoms, cough, expectoration and dyspnea, which usually call our attention to affections of the lung are present in such a large proportion of the cases of mediastinal disease, that errors in diagnosis easily occur. For greater assurance in differential diagnosis, therefore, a careful consideration of the anatomy of the mediastinum and of the characteristic features of the various diseases by which it may be invaded is essential.

ANATOMY OF THE MEDIASTINUM

The mediastinum includes the space bounded in front by the sternum, behind by the dorsal vertebrae, and laterally by the reflections of the pleurae. This space is arbitrarily divided into three subdivisions, designated, respectively, as the anterior, the middle and the posterior mediastinum.

Sometimes a fourth subdivision, designated the superior mediastinum, is made, comprising the space from the upper opening of the chest to the level of the upper part of the pericardium and the roots of the lungs, bounded in front by the manubrium sterni and posteriorly by the upper four dorsal vertebrae. The superior mediastinum, therefore, contains the arch of the aorta and the vessels arising from it, the innominate veins, the superior vena cava, and the upper part of the thymus. It is traversed by the trachea, esophagus, thoracic duct and the vagus, phrenic and sympathetic nerves.

The shallow anterior mediastinum lies in front of the pericardium and contains the lower portion of the thymus and a few lymph glands.

The middle mediastinum contains the heart, with its pericardium, and the termination of the inferior vena cava, while the roots of the lungs lie partly within this space and partly within the superior mediastinum. The posterior mediastinum, which lies between the spine and the middle mediastinum, contains the esophagus, the descending aorta, the thoracic duct, the azygos veins and the pneumogastric and sympathetic nerves.

The lymph glands in the mediastinal space are divided according to their positions into four groups: (1) anterior mediastinal or sternal, comprising those which lie in the loose areolar tissue between the sternum and the pericardium; (2) superior mediastinal, those situated in front of the upper part of the pericardium, the arch of the aorta and the left innominate vein; (3) posterior mediastinal, those situated along the course of the aorta and the esophagus, and (4) bronchial, those situated in front of and behind the bifurcation of the trachea, along the main bronchi and at the roots of the lungs.

SYMPTOMS DUE TO COMPRESSION

Most of the clinical phenomena associated with pathologic conditions in the mediastinum result from pressure on some one or more of the important structures contained in it. It is therefore an important aid to diagnosis to be able to relate the symptoms in an individual case to the structures which are primarily involved.

Compression of the Veins.—Pressure on the superior vena cava causes cyanosis or lividity of the face; suffusion of the conjunctivae; prominence and staring of the eyes; edema of the face, neck, upper part of the thorax and arms, and distention and dilatation of the superficial veins of the face, neck and upper part of the body. This venous involvement may extend as low as the umbilicus, and may include the mammary and the superior epigastric veins. In addition to these phenomena, compression of the superior vena cava may cause headache, vertigo, epistaxis, tinnitus, deafness, disturbance of vision and somnolence.

Compression of the vena azygos major causes dilatation of the intercostal veins, especially of those on the right side; right-sided hydrothorax, and occasionally pericardial effusion. Sometimes spinal symptoms have been noted, with resultant sensory and motor disturbances of the legs and lower portions of the body.

The chief physical signs of obstruction or compression of the inferior vena cava are edema of the lower part of the body and of the legs; albuminuria, and dilatation of the superficial veins of the lower part of the body.

Compression of the Arteries.—Compression of the aorta and its branches, the innominate, the left common carotid and the subclavian arteries, causes diminution in the size and equality of the radial pulses; alteration of the pulsation in the carotid arteries; engorgement of the left side of the heart; pallor, giddiness, and anginal pains.

Pressure on the pulmonary artery produces cyanosis and engorgement of the right side of the heart, with later evidences of cardiac decompensation.

Compression of the Air Passages.—Compression of the trachea is marked by stridor, dyspnea, persistent coughing—the so-called "gander" cough—and occasionally hemoptysis.

* Read before the Laënnec Society of Ontario, Peterboro, Ont., Nov. 2, 1921.

Pressure on the bronchi produces coughing, diminished tactile fremitus, and voice sounds over the area of the lung corresponding to the affected bronchus.

Compression of the Esophagus.—This is marked by dysphagia.

Compression of the Thoracic Duct.—This produces emaciation, chylothorax and chylous ascites.

Compression of the Heart and Pericardium.—This causes displacement of the heart, pericardial effusion and irregular heart action.

Compression of Nerves.—Compression of the vagus causes irregularity of the heart action with marked slowing, syncope, vomiting, dysphagia and spasmodic coughing. Pressure on the inferior laryngeal causes paralysis of the posterior crico-arytenoid muscles with resultant stridor, inspiratory dyspnea, and a peculiar paroxysmal resounding cough. Pressure on the sympathetic nerves is marked by irregularity of the pupils, dilatation of the pupil on the affected side being frequently observed, although in other cases the pupil is contracted, the variation depending on the degree of pressure on the nerve. The vasomotor disturbance due to interference with the sympathetic nerves influences the nutrition and temperature of the face and neck. Pressure on the intercostal nerves on the affected side where they emerge from the spine causes painful neuralgias along their course.

Outward Pressure on the Sternum or on the Spine.—This may cause bulging or erosion of the sternum and of the costal cartilages. Erosion of the vertebrae also may occur, with resultant motor or sensory disturbances below the level of erosion, or even paraplegia.

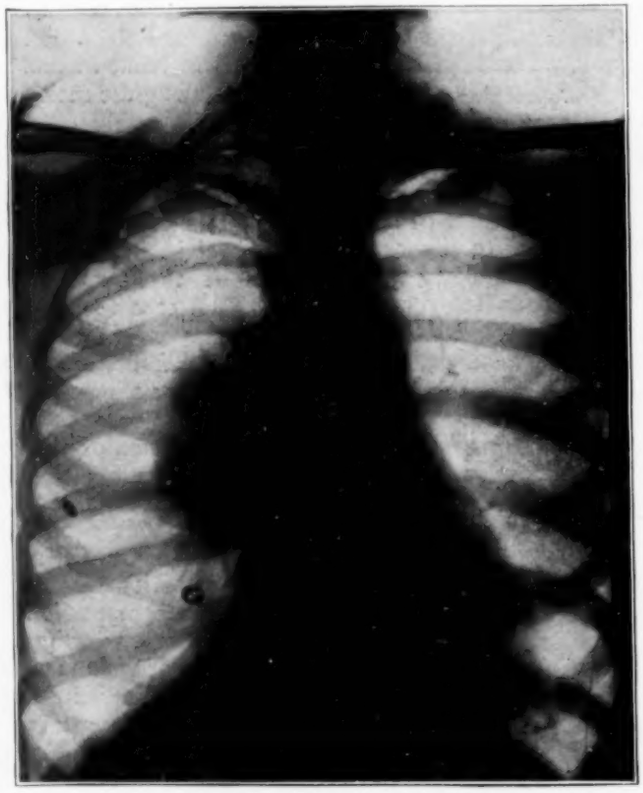


Fig. 1.—Mediastinal carcinoma, metastatic from breast.

HISTORY AND EXAMINATION

The importance of a careful and searching inquiry into the history of a patient in whom disease of the mediastinum is suspected cannot be overestimated. The duration and severity of such symptoms as pain, coughing, hoarseness and shortness of breath should be minutely investigated, in order that proper valuation may be placed on their importance. In a case in which the presence of a tumor is suspected, it is essential to consider the possibility that a primary tumor may be present elsewhere. In one recent case in which there was a tumor of the right lung, I was at a loss to find the primary focus until I discovered that, several months before, the patient had been under treatment with radium for an ulcerated pigmented mole on the surface of the abdomen.

The physical examination should be complete, and should include a neurologic examination. A rectal examination also should never be omitted. Inspection of the chest plays an important part in the diagnosis. The examiner should look for distention of the veins over the upper part of the chest and over the head and neck; for edema of the face, neck or upper extremities; for bulging of the sternum, and for swollen glands above the clavicle. By inspection and by palpation, the presence or absence of the expansion of the two sides of the chest, displacement of the trachea, and the position of the apex beat of the heart should be determined. Percussion will often identify a widening of the area of mediastinal dulness, particularly in the second and third interspaces on each side of the sternum. Percussion of the lungs will reveal also the flatness or impairment of resonance which results from the compression of a bronchus or from the effusion of fluid into the pleural cavity. Percussion over the sternum will often elicit a definite tracheal tone in the case of a tumor in the superior mediastinum. Auscultation will reveal the changes in the breath sounds over the lungs which result from the presence of fluid in the pleural cavity or from bronchial compression. Howard has described a leathery friction rub over the sternum which occurs in certain cases of mediastinal disease.

The roentgen-ray examination of the chest, by means either of the roentgenoscope or of the roentgenogram, has added a great deal to our diagnostic equipment for the detection of mediastinal tumors. If any doubt regarding the diagnosis remains after a careful physical examination of the chest, either a fluoroscopic examination or roentgenograms of the chest should always be made. I believe that a fluoroscopic examination of the chest should be made in every patient over 50 years of age. In this way we shall detect in many a case the presence of a dilated aorta or of a mediastinal tumor that would otherwise be missed. I do not mean that the roentgen-ray examination should take the place of a careful physical examination, but rather that it should supplement the findings of the latter.

TUMORS OF THE MEDIASTINUM

Excluding aneurysm, tumors of the mediastinum form the most interesting and the most important group of diseases of this region. These may be primary or secondary, malignant or benign. Almost every type of tumor may be found in the mediastinum. I shall describe briefly the characteristics of fibroma, lipoma, chondroma, osteochondroma, myoma, sarcoma, carcinoma, simple cyst, dermoid cyst, teratoma, hydatid cyst and syphilitic gumma, the enlarged lymph glands that may occur from Hodgkin's disease, leukemia, tuberculosis and intrathoracic goiter.

Fibromas of the mediastinum are very rare. Hare, in his monograph, reports only seven cases from the literature. Fibromas may arise from the sternum or from the cellular tissue of the mediastinum. They are solitary and rarely reach any great size. Steven has reported one case which he regarded as a fibrous tissue tumor of the mediastinum, associated with pronounced rheumatic symptoms. He believed that this was of rheumatic origin and described it as a "malignant fibrosis."

Lipomas are rarely found in the mediastinum. They occur singly, and sometimes may reach an enormous size, as in one case reported by Leopold [1] in which the tumor weighed 17 pounds 6 ounces (7.9 kg). This patient, a man, aged 37, seventeen months before death, began to cough, and to suffer shortness of breath, a sense of oppression beneath the sternum, and wheezing. As the tumor grew, his dyspnea became so alarming that he had to sit upright and to lean forward in order to get any comfort. In the later stages, it was possible for him to sleep only when in the knee-chest position. The cyanosis of his head and neck became very marked, and there was swelling of the lower extremities. Before death the tumor filled about four fifths of the chest.

Chondroma and osteochondroma are also of very infrequent occurrence within the mediastinum. They may grow from the under surface of the sternum or costal cartilages, or from the anterior surface of the vertebral column.

Myomas may arise from the muscle tissue of the trachea, the bronchi or the esophagus. Coats [2] has reported one case in which the myoma was pedunculated, and situated within the lumen of the esophagus.

Fig. 2.—Intrathoracic goiter extending well below the clavicle, and causing choking sensations and shortness of breath.

According to the recent literature, different forms of sarcoma—lymphosarcoma, spindle-cell sarcoma and giant-cell or chondrosarcoma—comprise the group of tumors that are most frequently found within the mediastinum. These tumors originate in the loose connective tissue of the mediastinum, in the peribronchial and mediastinal lymph nodes and in the thymus. For some reason they are twice as common in males as in females. Christian has reported the age distribution among one hundred cases of sarcoma of the mediastinum, and his figures are reproduced in the accompanying tabulation.

Secondary sarcoma of the mediastinum may follow the occurrence of sarcoma in the arm, leg or other parts of the body, while primary mediastinal sarcoma may be followed by metastatic nodules in the liver, spleen or kidneys.

Mediastinal carcinoma is usually secondary to carcinoma elsewhere, as in the breast or gastro-intestinal tract, but in rare cases primary carcinoma of the mediastinum occurs, the growth arising from the epithelium of the esophagus, the trachea, the bronchi, the thymus or from a misplaced or accessory thyroid gland (Fig. 1). This form of growth is invasive in character, so that edema, cyanosis and dilatation of the veins indicate the diagnosis of carcinoma rather than of sarcoma.

Simple cysts are of more frequent occurrence within the mediastinum than are dermoid cysts. They are usually small, and are lined with ciliated epithelium. It is usually supposed that they are derived from a fetal misplacement of tissue associated with the development of the esophagus.

The majority of cases produce no symptoms, though Bramwell has reported one case in which an incorrect diagnosis of aneurysm was made.

Among the rarer tumors of the mediastinum are the dermoid cysts and teratomas. Hamann [3] has recently reported a case in a patient who had previously been sent away for treatment for tuberculosis. Ultimately, hairs found in the sputum indicated the correct diagnosis. In these cases the most important symptoms are coughing, pain in the chest, and abundant expectoration, which sometimes contains hairs. Lemon [4] mentions the fact that W. J. Mayo has seen two cases of dermoid cyst of the mediastinum in which the diagnosis was made from the appearance of bits of hair and of teeth in the sputum. Trudeau has seen one similar case. In 50 per cent. of the cases of dermoid cysts, symptoms appear before the age of 20. The cysts vary in size from that of a walnut to a child's head, and in the latter instance may contain as much as 3 liters (quarts) of fluid. The walls of the cyst may contain fragments of bone, of cartilage, of teeth and of gland tissue. Hemoptysis is not uncommon, and the sputum frequently has a foul odor, and often contains fat droplets and cholesterin crystals. In

AGE DISTRIBUTION IN ONE HUNDRED CASES OF SARCOMA OF MEDIASTINUM

Years of Age	Cases
Before 10	9
From 11 to 20	20
From 21 to 30	17
From 31 to 40	18
From 41 to 50	19
From 51 to 60	12
From 61 to 70	4
From 71 to 80	1

1. Leopold, R. S.: A Case of Massive Lipoma of the Mediastinum, Arch. Int. Med. **26**: 275 (Sept.) 1920.
2. Coats: Glasgow M. J. **4**: 201, 1872.
3. Hamann, L.: M. Clin. N. Am. **1**: 177, 1917.
4. Lemon, W. S.: M. Clin. N. Am. **3**: 635, 1919.

a few cases, pulmonary tuberculosis is associated with the presence of mediastinal dermoid cysts.

Mediastinal teratomas occur in young adults, the symptoms first manifesting themselves shortly after puberty. These tumors consist of solid masses of tissue containing many small cysts. The latter are lined by a variety of epithelium, while the stroma between them is composed of muscle, fat, cartilage, bone, fibrous tissue and neuroglia. These growths resemble the teratomas which are more commonly found in the ovary and testicle.

Hydatids, gummas and the enlarged lymph glands which arise from Hodgkin's disease, leukemia and tuberculosis may be found in the mediastinum. The tuberculous lymph glands and syphilitic gummas rarely attain a sufficient size to be classified as tumors, while in Hodgkin's disease and in leukemia the lymph glands not infrequently become sufficiently enlarged to be so considered.

Intrathoracic goiter is frequently found in the superior mediastinum. This may be an extension from the

Fig. 3.—Substernal metastatic carcinoma of thyroid.

lower pole of the lateral lobe or of the isthmus of the thyroid gland, or it may develop from an accessory thyroid gland. In the cases in which it arises from the thyroid itself, a connection can always be traced between the thyroid itself and the intrathoracic goiter, which is identified by its upward and downward movement with deglutition.

SYMPTOMS OF MEDIASTINAL TUMORS

The symptoms of a mediastinal tumor are usually of gradual onset. The most important symptom is pain, which may vary from a feeling of pressure to a burning sensation, while in some cases it is of a very distressing or agonizing character. In general, the pain is quite constant, though there are periods of acute exacerbation. In certain cases the pain is localized beneath the sternum, while in others it is felt as a girdle-like sensation, with the greatest tenderness in the axillary line at the points of exit of the intercostal nerves or of their branches. It may be referred to the neck or to the abdomen, or may be felt along the distribution of the brachial plexus. Abnormal sensations may be referred to the throat, simulating the presence of a foreign body; or the act of swallowing may cause pain.

Disturbances in respiration form another important group of symptoms. There may be simply a steadily progressive shortness of breath, but in many instances the tracheal obstruction may cause a well defined inspiratory stridor, which is often accompanied by wheezing. Sometimes, as in the case of an intrathoracic goiter which slips in and out of the superior strait of the thorax, there may be very severe attacks of suffocation, owing to the incarceration of the goiter in the superior strait (Fig. 2). If the phrenic nerve is irritated, hiccup may be present. Because of the interference with respiration, cyanosis is often present; and this, together with the stridulous breathing, has led to the incorrect diagnosis of asthma in many cases of mediastinal tumor.

On account of the difficulty which they have in breathing, many of these patients are obliged to sit up in a chair during the night in order to get any sleep. They are often more comfortable in a leaning forward position or, as in the later stages of the extraordinary case of a large lipoma which has been mentioned above, the patient may have to assume the knee-chest position in order to breathe with any degree of comfort.

Coughing is a constant symptom of mediastinal tumor. In many cases this is an attempt on the part of the patient to get rid of a constant feeling of obstruction; but it may be paroxysmal in character. It frequently has a curious resounding character—the so-called "gander" cough. In many instances the cough is accompanied by hoarseness or loss of voice, which may be due to interference with the recurrent laryngeal nerves. The expectoration as a rule is small in quantity and consists of thin, viscid mucus; but at times it is profuse, mucopurulent or purulent, and if the tumor is a dermoid cyst the expectoration may contain hairs or other characteristic structures. The expectoration is often streaked with blood; or, if the tumor invades the trachea, there may be profuse hemoptysis.

Dysphagia is another important symptom of mediastinal tumor, not only in those cases in which the tumor originates in the esophageal tissue, but also in other cases in which the tumor exerts pressure on the esophagus. Deglutition may be painful and, as the obstruction progresses, a pouchlike dilatation of the esophagus may form about it, with resultant regurgitation of food.

Cardiac and Arterial Symptoms.—Cardiac palpitation and other cardiac disturbances may be caused by pressure on the heart, due to effusion into the pericardium, to obstruction of the pulmonary veins, to compression of the aorta, or to nerve disturbances resulting from involvement of the vagus or of the sympathetic nerves. Anginal attacks may also occur. Depending on which arteries are compressed, there may be inequality of the radial or of the carotid pulse. A case of mediastinal tumor has been recorded in which there was compression of the descending aorta and the inferior vena cava, with gangrene of the extremities. Pressure from a mediastinal tumor may produce an erosion of the aorta with resultant fatal hemorrhage.

Venous obstruction may cause puffiness of the eyes, swelling of the face, neck and arms, headache, dizziness and disturbance of vision, and the patient himself may notice the increasing enlargement of the veins of the upper part of the trunk.

PHYSICAL EXAMINATION

Inspection and palpation yield more information than any other form of examination. A bulging of the chest wall can often be seen at a glance (Fig. 3). There may be an abnormal pulsation which may be due to aneurysm or to a tumor, the pulsation being

Fig. 4 (Case 6).—Venous thrombosis from obstruction due to intrathoracic goiter.

transmitted to the latter from the aorta. There is often a noticeable tumor extending above the upper border of the manubrium sterni, with enlargement of the glands of the neck and of the axilla. It is important to note whether or not there are any tumors in the breasts or in the superficial tissue of the chest. Distention of the veins, either unilateral or bilateral, should be noted. In extreme cases in which the superior vena cava is obstructed, there are cyanosis and swelling of the face, neck and upper extremities; and the veins of the chest and upper abdomen become enormously enlarged in the attempt to set up a collateral circulation (Figs. 4 and 5). In cases in which a pleuritic effusion is complicating a mediastinal tumor, there is bulging of that side of the chest; while, if a bronchus is obstructed, the afflicted side may be somewhat retracted.

In some cases the larynx will be found fixed; that is, it no longer ascends and descends with deglutition and respiration. Occasionally a definite tracheal tug can be made out, though this is much more common in the presence of aneurysm than of a mediastinal tumor. In cases of large mediastinal tumors, the pulmonary expansion is much interfered with; for example, when one lung is embarrassed there may be excessive activity of the other. Tracheal obstruction will often cause a depression of the suprasternal, supraclavicular and epigastric regions. In some cases, the breathing is entirely abdominal. In cases in which a bronchus is obstructed or there is an effusion into the pleural sac, the tactile fremitus is much diminished over that part of the chest which corresponds to the involved bronchus or to the site of the fluid in the pleural cavity.

Percussion of the chest in the case of a small tumor or of one situated in the posterior mediastinum may reveal no evidence of its presence. However, in the majority of cases, there will be a dulness in the region of the manubrium sterni which gradually increases with the size of the growth. In the case of a large tumor in the posterior mediastinum, percussion in the region of the dorsal spines may elicit an abnormal sound. If the growth has extended to the lung, if a bronchus is compressed, or if there is an accumulation of fluid in the pleural cavity, the resonance on the corresponding side of the chest will be impaired to varying degrees, the impairment of resonance being increased by the presence of pericardial effusion. Sometimes the relaxation of the lung in the neighborhood of the tumor will produce a hyperresonant or tympanitic note.

The auscultatory signs vary a great deal in different cases. When a tumor is situated in the superior mediastinum, the breath sounds may be intensely tubular or even amphoric in quality. In cases in which the trachea is partially obstructed, the breath sounds may be feeble throughout both sides of the chest, but may be accompanied by a stridor. If one lung is affected, there is a decrease in the breath sounds on the affected side. At times, pleuritic friction sounds may be heard in the neighborhood of the growth. As a

Fig. 5 (Case 6).—Increasing venous obstruction, six months later.

rule, the vocal resonance is increased in the region of the tumor. There is often distinct pectoriloquy. Of course, the vocal resonance is diminished in the presence of pleuritic thickening or of pleural effusion.

The heart is often displaced, and frequently heart murmurs are heard over the precordium. At times a leathery pericardial friction rub can be heard.

As I have already stated, roentgen-ray examination of the chest, particularly by means of the fluoroscope, has made the diagnosis of diseases of the mediastinum much more exact. In the fluoroscopic examination, it is very important that the mediastinal space be viewed from different angles. The position of the trachea should be carefully observed, as any abnormal variation will indicate a displacement of the mediastinal contents.

Aneurysm usually produces a clear-cut shadow, regular in outline, which appears as a distinct bulging or expansion of the aorta or of the great vessels of the thorax (Fig. 6).

Intrathoracic goiter gives a broad shadow, which is continuous with the shadow in the neck and extends downward into the superior mediastinum, with displacement of the trachea toward the opposite side from that of the lobe from which the goiter has developed (Fig. 7). In some instances, both lobes of the thyroid are enlarged so that the intrathoracic enlargements may appear at different levels, thus producing an S-shaped trachea. In some cases of mediastinal intrathoracic goiter the trachea is compressed from before backward, assuming the shape of a saber sheath. Pulsation is sometimes transmitted from the aorta to the intrathoracic goiter so that it is difficult to distinguish this from an aneurysm. However, the fluoroscope will show the intrathoracic goiter moving upward and downward with deglutition and with respiration, and in the upward movement of deglutition the angle between the growth and the arch of the aorta becomes more obtuse. It should be noted, however, that in the case of a carcinoma of the thyroid gland there may be infiltration of the surrounding tissues with resultant fixation of the goiter.

Fig. 6.—Innominate aneurysm.

In cases of mediastinal sarcoma, distinct indications of an irregular involvement of the adjacent structures may be noted, such as a pleural effusion or metastatic deposits in the lung tissue. Tuberculous mediastinitis can often be differentiated from tumors of the mediastinum by its irregular mottled appearance, due to calcification of the lymph glands.

Syphilitic involvement of the mediastinum shows an extreme density of the hilum and mediastinal tissues; and the fact that this is often associated with aortic dilatation or elongation of the aorta serves to substantiate the diagnosis. Further evidence in these cases is, of course, obtainable from the history and the Wassermann reaction.

It may be difficult to differentiate a mediastinal abscess from a tumor, but in the cases in which a mediastinal abscess has developed from disease of the vertebrae, it usually assumes a fusiform character, gradually tapering off toward the diaphragm. Hodgkin's disease will often show large, discrete shadows corresponding to the individual glands, as is often the case with the enlarged glands of leukemia. In the latter case, blood examination serves to clear up the diagnosis. If the roentgenographic shadow of the tumor shows such structures as pieces of bone, or teeth, the presence of a dermoid cyst is established. The presence of an esophageal diverticulum can usually be readily differentiated from a tumor by means of a fluoroscopic examination after barium has been given by mouth.

The laryngoscopic examination often gives us the first clue to the presence of mediastinal pressure by disclosing a paralysis of one of the vocal cords, or by showing evidences of compression of the trachea.

Laboratory examinations may also be of service. For instance, in a case of mediastinal tumor associated with enlarged glands in the supraclavicular space, it is a very easy procedure to remove one of these glands for histologic examination, whereby the diagnosis can be made with certainty. Blood counts are of value, particularly in cases of leukemia. The examination of the sputum in cases with profuse expectoration or with hemoptysis is of value in differentiating the condition from tuberculosis. The finding of teeth and hair in the sputum will serve to clinch the diagnosis in the rare cases of dermoid cysts.

MEDIASTINITIS

Simple mediastinitis, in which there is a low grade of inflammation of the mediastinal tissues without suppuration, sometimes occurs. The symptoms of which these patients complain consist of fever, pain beneath the sternum, and occasional coughing. The physical examination gives no very positive findings. Sometimes crepitations can be heard along the border of the sternum. The condition usually runs a mild and comparatively short course.

Suppurative mediastinitis is always a serious disease. It is most commonly associated with tuberculous disease of the lymphatic glands. It may also be the result of injury, such as gunshot wounds; or of ulceration of the esophagus produced by the presence of foreign bodies, such as artificial teeth, or coins. It may be due to inflammatory conditions of the sternum or of the spine; or it may be secondary to an inflammatory condition in the neck, such as a retropharyngeal abscess, a suppurating thyroid, or a suppurating thymus, the inflammation spreading from the cellular tissues to the mediastinum. Again, there are cases that are the result of a general infection, such as erysipelas and pyemia, or the inflammation of the mediastinum may be an extension from an inflammatory condition of the lungs or pleural cavity. Abscesses of the mediastinum may rupture into the esophagus, pericardium, pleura, lung, trachea or bronchus. Cases are recorded in which an abscess has ruptured into the arch of the aorta, with resultant fatal hemorrhage. The chief symptoms of

suppurative mediastinitis are fever, which has a tendency to assume a hectic type, sweating, local pains, and a gradually increasing shortness of breath. All the pressure symptoms which have been previously described may be present. As the disease progresses, there is marked anemia, and wasting. The majority of these cases are fatal, though in some instances the pus may make its way to the surface wtih ultimate recovery. Should the abscess rupture into the trachea or bronchus, a large quantity of pus may be coughed up, or death may speedily result from suffocation.

Tuberculous Mediastinitis. — Tuberculosis may involve any of the groups of the mediastinal glands, but the tracheal and bronchial glands are most frequently affected. Involvement of the intrathoracic glands usually results from the extension of an infection from the neighboring structures, especially the lung or the pleura, and occasionally from bone. The tuberculous process may extend directly from the glands of the neck or from those in the abdomen along the lymphatics through the diaphragm. The condition sometimes follows an acute infection, such as whooping cough. It is more common in children than in adults. The glands have a tendency to become caseous with the formation of pus, this being a common origin of chronic abscesses within the mediastinum. They may perforate into the aorta or pulmonic artery, causing fatal hemorrhage; or they may ulcerate into the trachea or into the thoracic duct, in which case acute miliary tuberculosis may result.

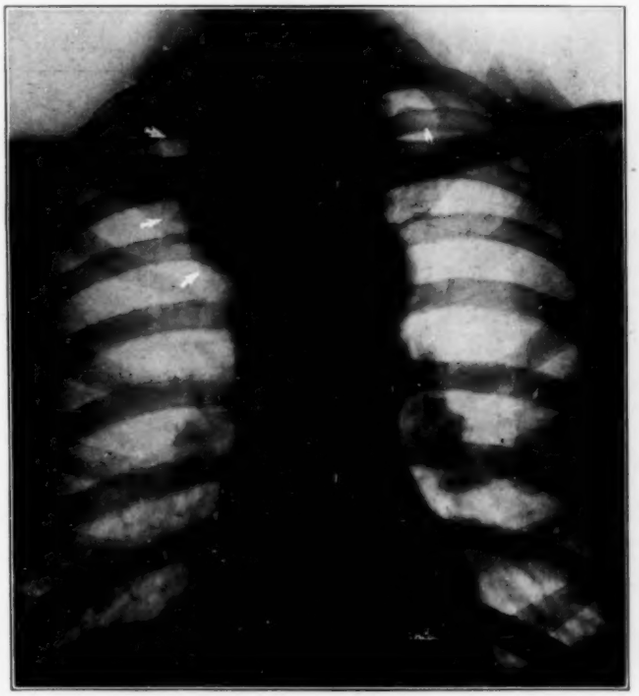


Fig. 7.—Intrathoracic goiter; outline indicated by arrows.

The symptoms of tuberculous mediastinitis are fever, wasting, anemia, night sweats, and loss of appetite; more or less disturbance in breathing, which sometimes simulates spasmodic asthma; and coughing, which may be spasmodic with a croupy quality, or may occur in paroxyms resembling the paroxyms of whooping cough. If the glands should ulcerate into the trachea, the patient may cough up purulent or caseous material. In some of the chronic cases, even calcareous particles may be expectorated. Physical examination discloses marked dulness over the sternum, particularly in cases of tuberculosis of the anterior mediastinal glands. Eustace Smith has described in children a venous hum which is audible at the root of the neck when the head is thrown back. This he attributes to pressure by the enlarged glands over the venous trunks. The pressure of the enlarged glands can be best diagnosed by stereoscopic roentgenograms of the chest.

Mediastinal emphysema may occasionally result from inflammatory conditions in the mediastinum, the air gaining access into the mediastinum from a perforation of the trachea or bronchus, or making its way from the neck beneath the deep cervical fascia. In some instances the air may extend through the cellular tissue of the neck or over the front of the chest, and give rise to an extensive subcutaneous emphysema.

ILLUSTRATIVE CASE HISTORIES

CASE 1.—*Mediastinal tumor from Hodgkin's disease.* A woman, aged 23, referred by Dr. W. A. Parks of Akron, Ohio, about two months before had begun to have a quite severe cough with very little expectoration. There had been no fever until within the preceding two days, when her temperature had ranged between 99 and 100 F. She had experienced some loss in weight and strength, and a few days before an enlarged gland, situated just above the clavicle, had been removed for examination. Microscopically, the gland showed the characteristic appearance of Hodgkin's disease: an increase in endothelioid cells, and the presence of giant cells and a large number of eosinophil cells.

The physical examination was negative except for the scar just above the clavicle resulting from the removal of the gland for examination. There was quite marked dulness in the second left interspace extending to about 3 cm. beyond the sternal border; over this area the breath sounds were bronchial in character, but there were no râles. The patient showed no glandular enlargement except that the epitrochlear gland on each side could be quite readily palpated.

Roentgen-ray examination revealed a mass about the size of an orange in the superior mediastinum. This was rounded, with quite regular outlines, and there seemed to be no inflammation. Under radium treatment this mediastinal enlargement gradually disappeared. In all, four separate treatments were given, extending over a period of about seven weeks.

CASE 2.—*Hodgkin's disease associated with enlarged glands in the mediastinum and hydrothorax on the right side.* A man, aged 30, seen by me, Sept. 19, 1920, complained chiefly of swelling of the glands of the neck, the axilla and the groin, with gradually increasing weakness and loss of strength. He had first noted loss of appetite and weight about four months earlier, before which time he had been extremely stout, weighing 205 pounds (93 kg.). At the time of this consultation, his weight was only 135 pounds (61 kg.). About eight weeks before he noticed that the glands of his neck were enlarged as well as the other superficial glands throughout the body. He had had a slight elevation of temperature, varying from 99 to 100.

The patient was somewhat pale, with enlargement of the glands below the angle of the jaw and in the posterior triangle of the neck. These varied from the size of a pea to that of a hickorynut. They were hard, discrete and freely movable, and showed no tendency to suppurate. There was a similar enlargement of the glands in the axilla and groin. The epitrochlear glands were not enlarged. Examination of the chest revealed the presence of considerable fluid at the base of the right lung. The patient reported that within the last two weeks he had been tapped three times, about 1 quart (liter) of fluid having been removed in the first two tappings, and more than 2 quarts in the last. This fluid was clear and straw colored. The patient showed marked dulness to the

left of the manubrium sterni, extending about 2 inches (5 cm.) beyond its border in the second interspace. These findings were confirmed by roentgen-ray examination.

CASE 3.—*Recurrent carcinoma in the mediastinum following carcinoma of the breast.* A woman, aged 60, first seen by me, April 1, 1915, having been referred to me for diagnosis by Dr. Lenker, who had found a paralysis of the left vocal cord, seven years before had had the right breast removed for carcinoma. One year before, a small tumor had been removed from the sternum. Four months before, the patient had had an attack of pleurisy which lasted about a week, shortly after which she had noticed a change in her voice, which had progressed to such a degree that it was difficult for her to speak above a whisper. At this time paralysis of the left vocal cord had been found.

The patient had a very troublesome cough, and reported that she had always had some shortness of breath. A roentgen-ray examination in February, 1915, had disclosed a tumor mass just above the bifurcation of the trachea.

Physical examination disclosed nothing of importance except that beneath the manubrium sterni there was a marked dulness which extended somewhat laterally on either side. The tumor mass beneath the sternum gradually increased in size, the cough become worse, the patient lost quite rapidly in weight, and her breathing became very labored. Finally, the tumor increased in size to such an extent that it became impossible for the patient to lie down, so that she usually maintained a sitting position in bed with a tendency to lean forward. She died six months later.

CASE 4.—*Mediastinal and pulmonary tumor, with compression of the superior vena cava.* A man, aged 47, seen one year ago, complained of pain in the left side of the chest and of an irritating cough unaccompanied by any expectoration; of swelling of the face on the right side, and of distention of the veins of the neck and upper part of the chest.

Physical examination disclosed some puffiness of the right side of the face and of the tissue beneath the right eye. The veins of the neck and upper part of the chest were prominent and dilated. Examination of the chest disclosed poor expansion at the base of the right lung, and over all this area there was marked dulness with diminished breath sounds. A hard mass about the size of an English walnut could be felt above the right clavicle, and there was some enlargement of the glands of the axilla and right groin. There was evidence of the presence of a considerable amount of fluid in the right pleural cavity.

From these findings the condition was diagnosed as due to a mediastinal tumor extending into the right lung. This diagnosis was confirmed by a roentgen-ray examination. No evidence of the presence of a tumor elsewhere in the body could be found.

CASE 5.—*Tuberculous mediastinitis with rapid improvement from radium therapy.* A woman, aged 18, consulted me, April 15, 1921, because of very marked shortness of breath with which she had been troubled for the preceding eight months, and which was steadily growing worse, until at this time it was so severe that it was impossible for her to lie down. In addition, she complained of a constant cough, occasional slight hemoptysis, night sweats and fever.

Physical examination disclosed the presence of enlarged glands just above the inner ends of both clavicles, and dulness both to the right and to the left of the manubrium sterni extending on either side for about 3 cm. There was increased bronchial breathing over this area. The trachea was pushed to the right. Roentgen-ray examination disclosed a mass of about the size of a grapefruit in the superior mediastinum. This mass semed quite dense, with quite regular outlines and definitely circumscribed. A gland, removed for examination, showed a chronic inflammatory condition of tuberculous nature. The patient was given six radium treatments, extending over a period of fourteen weeks, during which time the mass in the mediastinum disappeared. Within about one week after the first treatment she was so much relieved that her sleep was undisturbed.

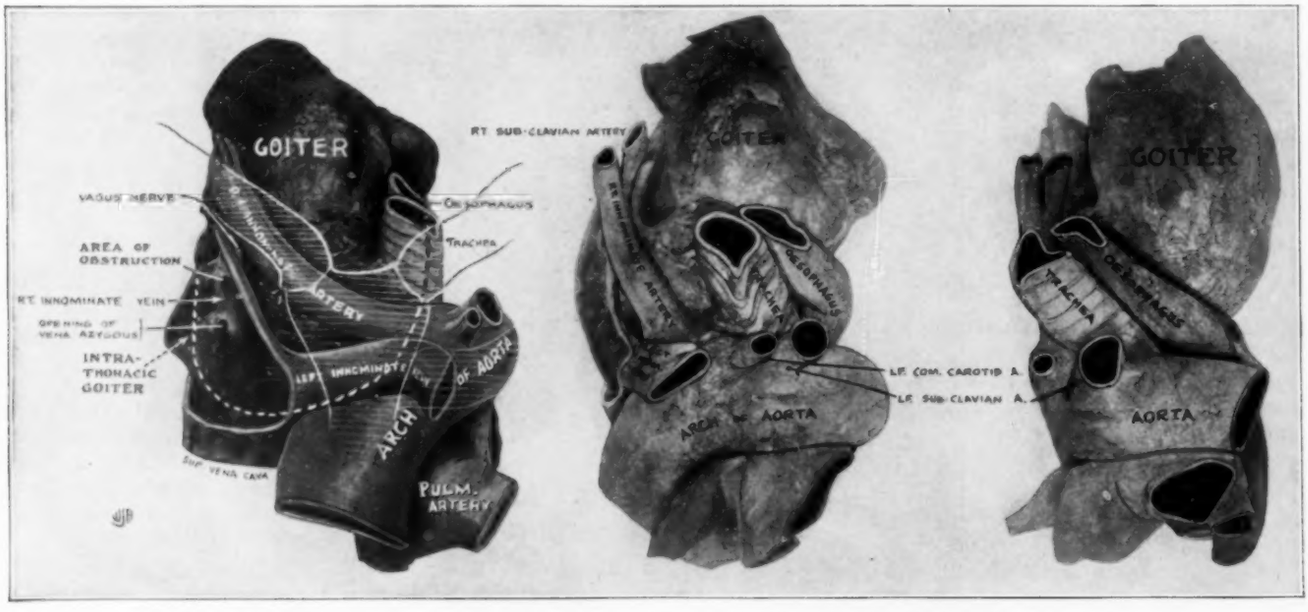


Fig. 8 (Case 6).—Necropsy specimen from patient with intrathoracic goiter shown in Figures 4 and 5.

CASE 6.—*Intrathoracic goiter.* A man, aged 62, seen March 7, 1921, had always been well until ten years before, when his face began to swell, his lips and face became cyanosed, and the veins over his body, particularly over the chest and neck, were very much distended (Fig. 4). The patient had never been very short of breath, and had never had any choking spells. He had noticed for at least ten years that he had a goiter, but he had never been troubled with palpitation of the heart, and had only occasionally noticed a shaking of the hands.

Examination disclosed a well-marked cyanosis of the face and hands, particularly of the lips. The eyes showed a moderate exophthalmos, with some slight lagging of the upper lid on looking downward, and increased widening of the palpebral fissue. There was no ocular palsy. There was an enlargement of the thyroid gland, particularly of the right lobe, which contained a hard, firm, adenomatous nodule about the size of a hen's egg. There was also a similar nodule in the isthmus about the size of a hickory-nut. The jugular veins were very much distended, and there was extreme distention of the veins over the chest and anterolateral portions of the abdomen.

The examination of the chest disclosed diminished expansion of the base of the right lung. There was increased tactile fremitus at the apex of the right lung in front and behind, while at the base of the right lung, from the angle of the scapula downward, the tactile fremitus was absent. The tactile fremitus over the left lung was normal. There was more or less impairment of resonance all over the right side of the chest, with dulness over the base of the right lung from the level of the angle of the scapula downward. There was also extensive impairment of resonance in the first, second and third interspaces below the clavicle. Over the latter area the breath sounds were bronchial in character, and a few coarse râles could be heard. Over the base of the right lung posteriorly there was almost complete absence of breath sounds.

The heart was enlarged in both diameters, with a systolic murmur at the apex. The pulse was somewhat irregular, arrhythmic, and the rate was 100; the systolic blood pressure was 126; diastolic, 76. The liver edge could be easily felt, and there was edema of the lower extremities. The Wassermann reaction was negative. The urine showed a trace of albumin and some granular casts. The blood count revealed red blood cells 4,290,000, white blood cells, 6,400, and hemoglobin, 80 per cent. The differential count revealed: polymorphonuclear neutrophils, 60 per cent.; small lymphocytes, 32 per cent.; large lymphocytes, 2.5 per cent., and transitionals, 5.5 per cent. The blood chemistry revealed: blood urea, 29 mg. per hundred cubic centimeters; blood sugar, 112 mg., and blood chlorids, 580 mg.

Fluoroscopic examination of the chest revealed a homogeneous shadow occupying the entire upper lobe of the right lung. The aortic arch was prominent. The trachea was not displaced. The mass was definitely connected with the mediastinum and pulsated, but not with the expansile pulsations characteristic of aneurysm. On deep respiration and deglutition the shadow did not separate from the aortic shadow.

The oblique view was of no aid in determining the character of the mass. The entire lower lobe of the lung was consolidated, having an irregular upper border with a dense base, the picture indicating fluid in the base with an inflammatory process above. The middle lobe of the lung was free from involvement. The heart was apparently normal in shape and position, but somewhat increased in size. From the fluoroscopic findings, the diagnosis was probable aneurysm. Roentgenograms of the chest confirmed the fluoroscopic findings, with the exception that a rather indistinct regular shadow could be seen within the homogeneous mass. This was interpreted as a probable saccular aneurysm with syphilitic involvement of the rest of the lung.

In addition to this, the diagnosis included adenoma of the thyroid, chronic myocarditis with beginning decompensation, and hydrothorax with infiltration at the base of the right lung.

The patient was advised to rest, and 15 minims (1 c.c.) of tincture of digitalis with 5 grains (0.3 gm.) of sodium iodid three times a day were prescribed. We expected him to return in two weeks for further observation, but he did not return until September 12. He had been taking the iodid regularly, and had lost 40 pounds (18 kg.); the edema of the extremities had disappeared, and the cyanosis was somewhat decreased (Fig. 5). His pulse rate, however, had increased to 120. He showed a marked tremor of the hands, his skin was very moist, and he had been troubled with diarrhea.

Examination of the chest revealed that there was some diminution in the area of dulness below the clavicle on the right side. The signs of fluid at the base of the right lung had disappeared. Roentgen-ray examination of the chest at this time, plates giving anterior, posterior and oblique views being taken, revealed quite a contrast to the picture taken at the first examination. All the inflammatory involvement of the upper lobe had disappeared, except for a dense, thickened pleura between the upper and the middle lobes extending to the periphery of the lung. The shadow, which was seen within the mass at the first examination, in these plates appears distinct and clear, and in the oblique view is seen to be continuous with a goiter shadow in the neck, and separated from the aorta.

There is very little doubt that the development of the symptoms of hyperthyroidism was due to the long-continued administration of sodium iodid, because in the preceding month, since the iodid had been discontinued, the patient had begun to gain in weight, the tremor of the hands was less, and he was not so conscious of the palpitation of the heart.

On the sudden death of this patient, shortly after his last visit, there was at necropsy a marked hyperplasia of both lobes of the thyroid gland and of the isthmus, with an intrathoracic goiter about the size of a small orange, extending from the lower pole of the right lateral lobe. This was covered by a thick capsule, which was adherent to the posterior and inner portion of the right apex of the lung, to the right vagus nerve, and to the right subclavian and innominate veins. The right innominate vein was almost completely obliterated by fibrosis, doubtless resulting from the organization of a thrombus (Fig. 8).

These necropsy findings justified our previous conclusion that the enlargement of the veins of the trunk and neck were the result of obstruction of the venous return to the heart through the superior vena cava.

The outstanding subjective symptoms of intrathoracic goiter are, therefore, as one would expect, the mechanical result of the position and degree of enlargement in the individual case.

SUMMARY

To promote greater assurance in the differential diagnosis of the different forms of mediastinal disease, an accurate knowledge of the anatomy of the mediastinum and the physiology of its structures is of primary importance for the proper relation thereto of the signs and symptoms which are presented by the individual case.

For the establishment of the diagnosis, the resources of the clinical and roentgenologic laboratories should be called into service, their findings being added to those of a painstaking physical examination and searching anamnesis.

It is only by relating the general characteristics of the various types of diseases which may invade the mediastinum to all the clinical findings in the individual case that an accurate diagnosis may be established.

Cleveland Clinic, Euclid Avenue at Ninety-third Street.

MADURA FOOT, MORE PROPERLY CALLED MYCETOMA

GUSTAV A. PAGENSTECHER, M.D.
SAN ANTONIO, TEXAS

The first of the two cases here reported is a very early form of mycetoma, involving a foot which shows early bone changes, with a later and more pronounced soft tissue involvement.

CASE 1.—A man, aged 54, married, with four children, all living and healthy, a laborer, whose work consisted chiefly of picking cotton and pick-and-shovel work, first noticed a gradual swelling of his right foot four years before I saw him, which was caused, he said, by a log falling on his foot. From that day there had been a gradual swelling, which had been characterized by absence of pain until four months before. The patient was healthy and very well developed, and the general physical examination was negative. The right foot was enlarged to one and one-half times the normal size, the enlargement being confined chiefly to the dorsum of the foot. The swelling began at the junction of the leg and foot, and extended downward to and including the proximal portion of the great and first toes.

The skin showed a brawny and nodular induration, studded with numerous healed-over sinus openings. The patient

stated that the multiple blind sinuses opened and exuded a small quantity of yellow material and spontaneously closed. When a portion of the epidermis covering the sinuses was removed, a yellow seropus exuded. Microscopic examination of the seropus revealed light yellow bodies, insoluble in acetic acid and potash, 1 mm. in diameter, showing a central body with branching mycelial threads.

Fig. 1. (Case 1).—Slight hypertrophy of involved foot, showing scaled over sinus opening surmounting the characteristic nodules.

The patient was held under observation for two weeks, during which time he manifested no temperature reaction. The blood pressure was: systolic, 130; diastolic, 80. The Wassermann reaction was negative; blood count revealed 4,200,000 red blood cells; hemoglobin, 90 per cent.; white blood cells, 8,000; polymorphonuclears, 61 per cent.; small lymphocytes, 42 per cent.; large lymphocytes, 3 per cent.; transitional cells, 4 per cent.

Roentgen-ray examination revealed a rarefactive and productive osteitis confined chiefly to the metatarsal and phalangeal bones of the great toe. The metatarsal bone of the second toe presented a healed fracture with fair position and slight excess callous formation.

The second case was a much further advanced form of mycetoma, the involvement in this case not being

Fig. 2 (Case 1).—An early stage of rarefactive and productive osteitis confined to the metatarsal and phalangeal bones of the great toe. The metatarsal bone of the second toe presents a healed fracture with clear position and slight excess callous formation.

confined to the foot but extending to the ankle and the distal portion of the tibia and fibula.

CASE 2.—A man, aged 47, whose father died at 80 and had always been healthy, whose mother was living at 60 in good health, and whose only sister was also living, in good health, at 45, had chickenpox when a boy, but no other infantile disorder. Later he had a "fever" (probably typhoid), which lasted about two weeks, from which he made an uneventful recovery. Ten years before I saw him he contracted gonorrhea, from which he recovered in a little more than a month. There was no history of syphilis, tuberculosis, alcoholism or drug habit.

The patient remembered that about seventeen years before, while bathing, he jumped into the river and struck a brick with the plantar aspect of the right foot. The blow was extremely painful, but he was afterward able to go on with his ordinary work as a laborer. He noticed that soon after he received this injury there appeared a small nodule on the sole of the foot, which finally opened and began to discharge a semiliquid material of a puslike character. About three years before I saw him, a heavy board accidentally fell on the same foot and over the injured dorsal area; there appeared a similar nodule, which opened and discharged, as did the nodule on the sole of the foot. Following the appearance of these two nodules there appeared similar nodules with their accompanying sinus orifices, distributed chiefly over the dorsal and plantar aspects of the foot; also, several appeared on the ankle and lower third of the leg. The enlargement or swelling of the foot had been gradual, but had produced no constitutional disturbances, as the general health of the patient had continued good in every particular.

Fig. 3 (Case 2).—Amputated foot, showing marked hypertrophy of the dorsum of the foot and the lower leg. The nodules in this case extended up as high as the lower third of the leg.

The patient presented the general characteristics of the true Mexican race: small stature, 5 feet 1½ inches (155 cm.); black, glossy, straight hair; dark eyes; prominent malar bones; scanty, stiff moustache; dark, or better, perhaps, bronze skin. The patient was well built and, barring his disease, there were no physical defects of the body. The gums were somewhat congested, but not to a point of an active gingivitis; there was some pyorrhea; the insertion of the two right upper incisors was defective, the first, especially, being back of its normal position. The right foot and ankle were enlarged to twice the normal size; the surface of the dorsum and plantar aspects presented nodules varying in size from that of a pinhead to that of a pea. The nodules were surmounted by pouting sinus orifices from which exuded the characteristic discharge containing yellowish granules. A probe easily passed, without pain, from the dorsal to the plantar aspect of the foot through many of the sinuses. There was an atrophy of the leg and some discoloration of its skin. The reflexes, except those of the diseased leg, were normal; there they were notably diminished.

Microscopic examination of the granules treated with dilute acetic acid revealed several bodies consisting of a small mass of closely matted filaments taking an oval shape, about

which there were a number of clubs arranged in a radial manner. At the periphery of the granules some of the clubs appeared branching and taking a fan-shaped arrangement.

The patient was held under observation for about three weeks, during which time he manifested no temperature reaction. The blood pressure was normal; the Wassermann reaction, negative; the red and white count, normal; hemoglobin, 80 per cent.

Fig. 4 (Case 2).—A very late stage of rarefactive and productive osteitis of all the bones of the foot and the distal end of the tibia and fibula.

Roentgen-ray examination revealed a rarefactive and productive osteitis confined to the lower end of the tibia, fibula and tarsal, metatarsal and phalangeal bones of the foot.

Sagittal section of the amputated leg and foot revealed the characteristic pathology of this disease: the soft parts, muscles, fascia, tendons, nerves and blood vessels had been displaced by granulation tissues, and only of late had there been destruction of bone.

NATURE OF MYCETOMA

These two cases are characteristic of typical Madura foot, or mycetoma. The history of the injury is clear in each instance, both patients being laborers and forced to make their living by manual means, closely associated with the soil, going barefooted a great deal while at work.

Both cases showed the pathognomonic granules insoluble in acetic acid, containing central clumps of closely matted mycelial threads. Jutting from the periphery of the granules were branched segmented mycelial threads containing what could be easily interpreted as a nucleus. This fact clearly demonstrates that the mycelial bodies are vegetative in character.

Madura foot is a chronic disease, as has been clearly demonstrated by the two foregoing cases. The first patient dates the onset of his illness to an injury received about four years previous. He has been able to work and still does light work. He has occasional pains, which he notices mostly at night, but is able to walk unassisted and without much inconvenience. The second patient dates the onset of his illness about seventeen years previous. When the patient was admitted to the hospital he was able to walk unassisted, although he complained of pain in his foot which prevented him from doing heavy work.

The treatment is essentially surgical. Only when the extremity is in such a condition that the patient is unable to get about in any manner do I recommend amputation. Since the disease does not metastasize by blood or lymph but only by slow, direct extension, the patient may easily outlive the course of his disease. Some authorities treat this disease by the administration of massive doses of potassium iodid, basing their therapy on the close similarity of Madura foot to actinomycosis. Other authorities treat by curetting the sinuses in conjunction with the administration of arsphenamin.

In the differential diagnosis of Madura foot, one has to exclude actinomycosis, tuberculosis, syphilis and sarcoma.

Actinomycosis rarely attacks the foot, being more likely to become a generalized infection; it is not so chronic, and a cure may be obtained.

In tuberculosis there may be a temperature reaction, bone destruction and quantities of pus escaping from the sinuses.

In syphilis, with comparatively as much involvement, a positive Wasserman reaction would be expected.

In carcoma, with the exception of the large round cell type, so commonly found in bone cysts, the growth would be more rapid and more extensive and probably have metastatic involvements.

Central Trust Building.

ERYTHEMA BULLOSUM

J. S. EISENSTAEDT, M.D.
Attending Dermatologist, Cook County Hospital
CHICAGO

Erythema bullosum is a rare type of erythema multiforme in which the exudation is so rapid and extreme as to cause bullae in addition to the edema which occurs in some of the more common forms.

I have had opportunity to study closely five patients suffering from a severe form of erythema bullosum, three of whom were desperately ill. For the sake of brevity I will detail only the salient points in each case.

CASE 1.—A well nourished man, aged about 50, of good social status, was seen on the fifth day following the appearance of the eruption. At this time it was generalized and chiefly bullous and vesicular, some of the bullae reaching the

Fig. 1 (Case 3).—Circinate, ringlike, erythematous patches, a few of which are just becoming bullous; intense involvement around mouth.

size of a quarter dollar. The bullae appeared on an inflammatory base. Some were tense, containing a clear, serous exudate; others were flaccid, part of the content apparently having found exit. The patient was acutely ill, the temperature being 101.6 F., and the pulse, 118. On account of lesions present in the mouth, he could take practically nothing but fluids, and even these occasioned considerable distress.

The outstanding etiologic possibility in this case was a severe pyorrhea alveolaris.

Treatment consisted chiefly in alkalizing the patient by sodium citrate by mouth and by proctoclysis of sodium bicarbonate solution containing sodium salicylate. Recovery occurred in about ten days.

CASE 2.—A negro, aged 22, seen at Camp Zachary Taylor in Kentucky in 1918, arrived at our camp from Camp Dodge, Iowa, with a vesicular and bullous skin eruption. He had been receiving routine treatment for syphilis. When I first saw him in the ward (which at that time was cubicled on account of influenza, according to orders from the Surgeon General's Office), the impression was obtained of an unusual exudative syphilis, which is seen occasionally in the colored race, or a pemphigus vulgaris. The eruption was widely distributed, especially over the extensor surfaces, and also involved the mouth so that even fluids could not be imbibed.

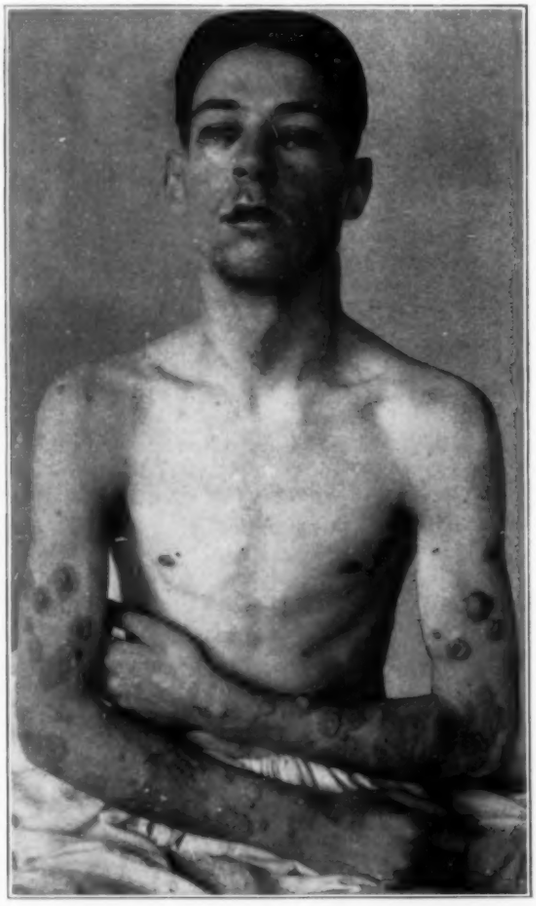


Fig. 2 (Case 4).—Involvement of extensor surfaces of both forearms with large, well defined, circinate and bullous lesions; marked involvement about mouth and eyes.

The patient was extremely ill, and a "critical telegram" was sent to his parents. His temperature reached above 104 F., which, however, in a negro is not an extraordinary febrile reaction. Bullae from the diameter of a nickel to that of a fifty-cent piece were scattered widely over the entire integument, especially on the forearms below the elbows, and the legs below the knees. The contents varied from an ordinary clear, serous exudate through all gradations to a distinctly hemorrhagic exudate.

A careful history and examination later in a well lighted room revealed the fact that the bullae appeared on a distinctly inflammatory base. Blood cultures were made and a white staphylococcus was obtained. We thought, however, that this might have been a contamination and repeated the examination, which yielded a sterile set of tubes. Positive blood culture reports appear not infrequently in the literature of erythema bullosum.

This patient became distinctly worse after an injection of 1½ grains (0.1 gm.) of mercuric salicylate in oil injected into the buttocks. It will be noted that he had received intensive arsphenamin and mercurial treatment at Camp Dodge, and was immediately hospitalized on his appearance at Camp Taylor. Careful examination failed to reveal any focal infection as causal in this case. There are several reports in the literature in which toxic substances of various groups, e. g., coal tar derivatives, potassium iodid and

Fig. 3 (Case 4).—Left forearm.

copaiba are held as etiologic factors in certain cases of erythema bullosa. My belief is that in this case mercury was the substance which occasioned the outbreak of the dermatosis. The patient was alkalized by proctoclysis as in the previous case. After seventy-four hours he was able to drink liquids, and large dosage of sodium bicarbonate and sodium salicylate were continued until complete recovery was obtained.

CASE 3.—A man, aged 54, brought to Cook County Hospital in my service, in July, 1920, suffered from a skin eruption manifested by widely distributed erythematous patches, ring-shaped in outline, most of which were the diameter of a ten cent piece. Figure 1 shows the widespread distribution of erythema multiforme patches, a few of which are just becoming bullous; also bullous lesions about the mouth. He had many lesions on the lips and on the buccal mucosae which, of course, were macerated. The patient was distinctly ill and could take nourishment only with the utmost difficulty and discomfort. His temperature was distinctly elevated, 102.4, and the pulse correspondingly high. After he had been in the house about thirty-six hours, many of the

Fig. 4 (Case 4).—Lesions about left knee; hemorrhagic content of some bullae may be noted.

lesions became bullous in character, with hemorrhage in some of them. The patient showed evidence of acidosis and became acutely ill, so that a lethal outcome was prognosticated by two physicians, who did not see the patient before the appearance of the bullae, and believed the patient had pemphigus. Examination of the mouth revealed an intense pyorrhea alveolaris; pus was readily expressible at any point along

the gingival margin. Treatment, as in the preceding cases, resulted in recovery.

CASE 4.—A man, aged 23, seen at Cook County Hospital, in 1920, in the service of Drs. Stillians and Oliver, Ward 44, came into the hospital complaining of a severe bullous eruption, chiefly on the extensor surfaces of the forearms and legs, and on the face about the mucous orifices. Figures 2, 3 and 4 show the distinctly bullous character of the lesions, some of which were distinctly hemorrhagic. Those on the arm are seen to be somewhat flaccid at the time the photograph was taken, and at the moment the exposure was made, one is in the process of rupturing, with release of hemorrhagic fluid.

In spite of the intense inflammatory character of this patient's eruption, he was at no time desperately ill, and none of the attending staff expressed any other than a favorable prognosis.

It will be noted from Figure 2 that many of the lesions are confluent and ringlike, and present the so-called herpes iris character. In this case proctoclysis did not have to be resorted to. Recovery was complete and uneventful. Examination revealed badly infected, cryptic tonsils as the likely etiologic factor in this case.

CASE 5.—A girl, aged 14 years, had suffered three previous attacks of a bullous eruption, during the last seven years, chiefly confined to the extensor surfaces of the forearm and hands. Her mother stated that these attacks occurred in the spring or the fall and were preceded by a sore throat. When

Fig. 5 (Case 5).—Enormous, discrete lesions, especially marked on dorsum of left hand.

I saw the patient, the condition of her hands was as shown in Figure 5. There were several large, tense bullae, with outer circles of vesicles and distinctly "iris" in configuration. Examination of the throat revealed badly infected, cryptic tonsils. These were removed, and there has been no recurrence of the dermatitis. Alkaline treatment and salicylates brought about rapid improvement in this case also.

The pathology of erythema bullosum has been carefully studied and consists, at first, in a simple hyperemia due to vascular dilatation, followed by a paresis of the cutaneous vessels, arterioles and capillaries, with cell proliferation and edema. The epidermic changes are most marked in those cases in which there is the greatest amount of exudate. The covering of the vesicles and bullae consists of the horny layer and sometimes of the entire epidermis.

The differential diagnosis is chiefly from pemphigus, but can ordinarily be easily clarified.

CONCLUSIONS

These five cases seem to indicate, at least to me, that:

1. Erythema bullosum is a disease due to toxic substances.
2. The toxic substances may be from widely different sources.
3. In attempting to find an etiologic factor in different cases, it is well to rule out focal infections from the teeth, tonsils, etc.
4. Any focal infection present should receive expert attention after the subsidence of the attack.
5. Treatment directed to alkalizing the patient to the utmost and giving large doses of salicylates is of great value.
6. Proctoclysis for the exhibition of alkali salts and salicylates is indicated when the patient cannot take fluids by mouth.
7. Regardless of how desperate the condition may appear, recovery usually takes place under appropriate treatment.

25 East Washington Street.

PRIMARY ACTINOMYCOSIS OF THE SKIN

M. J. BASKIN, M.D.
ALLIANCE, NEB.

Actinomycosis, recognized in cattle by Bollinger, was first described in man by Israel in 1877. Ponfick, in the same year, showed that the disease in cattle was identical with that occurring in man. Infection with the organism is common in cattle, in which the disease is known as lumpy jaw. It is comparatively rare in man. The infection occurs most frequently by way of the gastro-intestinal tract, particularly in the mouth, but it at times starts in the lungs and rarely in the skin. Secondary skin involvement in actinomycosis as it ordinarily occurs is fairly common. Such skin lesions are more often about the face and neck, especially the lateral surfaces of the neck beneath the jaw.

Primary actinomycosis of the skin, however, is rare. Wallhauser,[1] in 1904, observed an extensive case in which the primary infection occurred on the point of the chin from without. Merian,[2] in 1912, found only twenty-five recorded cases occurring primarily in the skin, and reported another occurring at the corner of the mouth. The small tumor was excised, and its nature discovered on section. The method of infection is probably by direct contact of the fungus with the broken surface of the skin. From the original focus of infection, new areas appear as the result of direct extension of the disease. Metastasis is rare, and when it does occur is probably through the blood stream, the fungus having penetrated a vessel. The lymph glands are not involved, and when they have been reported as enlarged, secondary infection has probably been present, and the enlargement due to the latter.

The onset of primary actinomycosis of the skin is usually insidious, though occasionally it may be rapid. The symptoms are entirely local. No subjective symptoms are complained of. The temperature is not elevated, and the leukocyte count is normal. The first sign to be noted is a small, subcutaneous node, firm to pressure, not tender, and fairly movable. The skin over this node gradually becomes dirty blue, thins at some point, and finally bursts, discharging a tiny droplet of yellow matter. Innumerable nodules develop in the surrounding areas, each going through the same process. The well developed lesion shows these nodules in all stages of development. The picture then presents nodules of varying depth, the skin is boggy and purplish, and numerous small openings discharge the gray and yellowish-gray contents. The fungus stimulates a definite fibrous tissue formation. Each nodule is a mass of fibrous tissue with a very small cavity containing the parasite. From the size of the

1. Wallhauser: J. Cutan. Dis. **22**: 77, 1904.
2. Merian: Dermat. Wchnschr., January, 1912.

nodule one may expect quite an amount of pus on incision. The result, however, is a minute droplet.

In the most commonly recognized type of the disease, the fungus is found in the yellowish or grayish masses discharged from the nodules. Fine, interlacing filaments radiating from a common center with "club" formation may be seen. The filaments are slender and sinuous, and have an external sheath and protoplasmic medulla. The filaments grow rapidly and probably produce the disease. Bostrom "spores" (coccus and bacillus-like cells) may also be found.

In human beings the resistance to the growth of the micro-organism is active but not very effective. The parasite, therefore, multiplies rapidly, and numerous filaments occurring singly, in loose tangles and in colonies are often abundant. The hyaline clubs are usually rare and often entirely wanting. They probably represent a protective secretion of the marginal filaments. This fact is often forgotten and the true nature of the disease overlooked because of failure to find the "clubs." In cattle, because of the greater chronicity of the lesion, the actinomycetes appear as colonies surrounded by a well developed layer of clubs.

The organism produces a toxin of considerable strength, so that more or less extensive necrosis is always produced. Polymorphonuclear leukocytes and serum form the exudate. Occasionally a foreign body giant cell is seen.

The reaction to the lesion is characteristic in the formation of granulation tissue around the colony. Immediately outside this, fibrous tissue is formed. Such a protective mechanism, it would appear, should be an effective barrier against extension of the disease. This, however, is not the case. Extension is rapid and is produced by direct invasion of the capsule, so that necrosis and softening are produced and further extension rendered possible.

The disease is probably more common than is generally believed. It may be mistaken for blastomycosis, tuberculosis and cutaneous syphilis. The diagnosis is usually self evident on microscopic examination of the discharge. However, as has been pointed out by Wohl,[3] the radiating clubs may not be found in the smears, and are found only in sections of the necrotic tissue, or on culture. The stained smears from the agar and bouillon cultures show long and short rods with branching filaments. No club formation is noticed.[4] Since the publication of the article by Wohl, I have been convinced that a puzzling case, also a lesion on the hand, in which no diagnosis was made, was probably actinomycosis. Failure to make a positive diagnosis I attribute to the absence of the characteristic clubs in the discharge, though the disease was suspected.

Various remedies have been recommended as effective in the treatment of actinomycosis. Of these, potassium iodid is still most commonly used. Good results are usually reported from its use. It is given in small doses at first, well diluted, and gradually increased to tolerance, much in the same manner as it is given in syphilis. In spite of the claim of an "almost" specific, potassium iodid does not inhibit the growth of *Actinomyces* in culture, even in high concentrations. Bevan,[5] in 1905, suggested the use of copper sulphate internally in the dosage of from one-quarter to 1 grain (0.016 to 0.065 gm.) three times a day. Locally, 1 per cent. solution was recommended. The method has proved of some value. Used in conjunction with the roentgen ray, it has proved of value in a case described by Zeisler. In my case, potassium iodid proved to be of no value whatsoever. Surgical treatment, consisting of an incision of the nodules and curettement of the lesion, should be instituted at once. Surgical solution of chlorinated soda (Dakin's solution), then applied, gives prompt results. The lesion is covered with gauze, kept constantly saturated with Dakin's solution. At intervals, moist heat is applied over the gauze. This results in the decomposition of the Dakin's solution with the liberation of free chlorin, and to this I attribute my results.

REPORT OF CASE

H. M., aged 35, a farmer and trapper, presented himself, May 3, 1919, with a lesion of the left hand. He had been trapping, and the lesion commenced a week before. Thinking it a boil, he painted it with iodin. The patient was healthy, with no subjective symptoms and all findings negative except the left hand. The temperature was normal. The leukocyte count was normal. The Wassermann reaction was negative. On the left hand was a lesion covering the wrist and entire dorsum of the hand, and extending onto the dorsal surface of the fingers. The skin was purplish, with numerous small sinuses and firm nodules. One of the nodules was incised and a minute droplet of pus expressed. Microscopic examination disclosed the fungus. The nodules were incised and the lesion curetted. Administration of potassium iodid was instituted, and boric acid dressings were applied. At the end of ten days the lesion showed no improvement and had increased in extent. May 13, the Dakin's solution as outlined above was used, and immediate improvement began. In one week the lesion had been reduced in extent by one half and appeared then as shown in the accompanying illustration. By June, two weeks after the institution of the treatment with Dakin's solution, the lesion was healed, leaving no scar. There has been no return to date.

Appearance of hand after one week's treatment with surgical solution of chlorinated soda.

3. Wohl: Nebraska M. J. **4**: 134 (May) 1919.
4. Wright: J. M. Res., 1904-1905, p. 307.
5. Bevan, A. D.: Treatment of Actinomycosis and Blastomycosis with Copper Salts, J. A. M. A. **45**: 1492 (Nov. 11) 1905.

Physician as Instructor in Health.—The general public today has just enough knowledge of personal hygiene to excite its interest and desire for more. People are more anxious to hold onto health than at any former time. Health notes in the daily and weekly press are eagerly read by great numbers. What is needed and what is being asked for in a measure is a fuller knowledge of the principles of physiology applied to the maintenance of personal health. Because of his knowledge and his right of entry into the homes of the people, the general practitioner of medicine is the individual best equipped of all the health agencies to render this service, representing as he does the one point of contact between scientific research and popular need.—Sir Napier Burnett, *Nation's Health* **4**:191 (April) 1922.

A PLEA FOR THE EARLY RECOGNITION OF UROLOGIC CONDITIONS *

P. A. JACOBS, M.D.

Senior Assistant in Surgery, and Chief Clinician in Urology, Outpatient Department and Night Clinic, Mount Sinai Hospital

CLEVELAND

Urologists agree that a large percentage of their cases are either beyond remedial measures, or so far advanced that extensive surgical interference is necessary to improve their condition or cure them, and that many of these cases would not have advanced so far, had a correct diagnosis been made earlier. From an analysis of the postmortem records of urologic cases at Johns Hopkins Hospital between 1912 and 1914, Hinman concludes that in more than half of the deaths the cause was acute infection, indicated clinically by the history, and pathologically by finding cystitis, pyelitis, pyelonephritis and pyonephrosis. These and other well recognized facts emphasize the danger of urinary infection which so often follows misdirected treatment in cases involving the urogenital tract.

The foregoing condition is due to the fact that too much reliance has been placed on the efficacy of urinary antiseptics; these patients have invariably been fed on drugs regardless of the pathologic condition present. Another reason is that the practitioner frequently does not understand the urologic symptoms, or fails to interpret them correctly, disregarding the final outcome of a particular case with urinary symptoms.

We have all seen cases with symptoms of a surgical condition of the urogenital tract that have been treated with urinary antiseptics and bladder irrigations for many months and even years. We are also familiar with that type of patient who has been operated on for almost every conceivable condition in the abdomen and pelvis, when, as a matter of fact, the real pathologic condition was in the urinary tract. The same patients, their symptoms existing months and in some cases years, not having been relieved, have in many instances been reoperated on two or three or even more times, without knowing that the real trouble was in the urinary tract. O'Niel maintains that 25 per cent. of the patients with ureteral calculus that came to operation at the Massachusetts General Hospital had previous intra-abdominal operations for appendicitis and other abdominal conditions without relief.

It is evident, therefore, that one should not place too much reliance on the efficacy of urinary antiseptics, or depend too much on the physical examination or a urine analysis for a diagnosis of urologic conditions; if an abnormal condition is found, the administration of drugs and bladder irrigations should not be kept up indefinitely in the hope that the so-called cystitis will improve. Cystitis as such is a symptom of some abnormal condition referable to the urinary tract and not a separate and distinct entity, the only exception being, possibly, infection of the bladder following instrumentation.

To discuss the symptoms of diseases of the urogenital tract is not within the scope of this paper, because of the limitation in time and because this phase of the subject is well covered in modern books on urology. However, in analyzing these symptoms one becomes convinced that pain and tenderness, while they are important symptoms of urologic conditions, fail in their reliability because they too often simulate other conditions, whereas pus in the urine, blood in the urine and disturbances in the function of micturition (frequency, urgency, pain, burning, retention and incontinence) are symptoms that should receive serious consideration, as they are definite signs of pathologic conditions of the urinary tract that demand investigation to determine their cause.

With the means at our disposal for making correct urologic diagnoses and applying the proper remedy, it is certain that many extensive surgical procedures both on the urinary tract and outside the urinary tract could be avoided, thereby resulting in fewer unnecessary operations, fewer monorenal persons and, in all probability, fewer cases of malignant disease either beyond control or already engrafted on a lesion primarily benign.

ILLUSTRATIVE CASES

CASE 1.—*History.*—A man, aged 59, admitted, Dec. 2, 1921, complained of bleeding from the bladder occurring every five or six months for the last six years. The bleeding lasted two or three days, and was painless. There had been frequency and terminal pain for the last six years. Cystoscopy revealed a papillomatous tumor of the bladder. December 5, a suprapubic cystotomy for excision of the tumor was performed. A large tumor mass involved the left lower portion, including the sphincter and prostate, making it inoperable. Two days later, radium was inserted through the suprapubic wound. The pathologic report was: papillary carcinoma.

Comment.—This patient had definite symptoms of a pathologic condition of the urinary tract for six years, which probably began as a benign papilloma. As in many of these cases, a malignant change took place later. Had the diagnosis been made when the symptoms indicated the necessity for investigation (six years before), a total excision of the tumor at that time would have given the patient a much better chance to live.

CASE 2.—*History.*—A man, aged 57, admitted, Dec. 18, 1920, complained of pain in the left lumbar region. Six weeks prior to admission he had a severe pain in the region of the left kidney, accompanied by a large amount of blood in the urine. The left testicle became enlarged and tender. He had noticed blood in the urine about a year, and was receiving treatment for it from his family physician. The patient was poorly nourished, the skin was pale, and there was marked tenderness and rigidity over the left kidney. The left testicle was about twice as large as the right. The urine contained a large number of red blood cells. The roentgen ray revealed no shadows in the region of the left kidney; the lower pole was much lower than normal. Cystoscopy revealed a pouting left ureteral orifice. A No. 6 ureteral catheter was passed without obstruction, and clear urine was obtained from both sides (red blood cells from the left side microscopically). The appearance time of the functional test on the right side was seven minutes, and on the left side, twenty minutes. Sodium bromid solution was injected for pyelography, 7 c.c. on the right side and 18 c.c. on the left side. The roentgen ray revealed the left kidney pelvis moderately dilated, the upper minor calices elongated. The middle calices were widened, elongated and distorted. There was marked irregularity of the lower calices. The diagnosis was: left renal tumor. Nephrectomy was performed. Practically no normal tissue was seen on section. The diagnosis now was: hypernephroma.

Comment.—The significance of hematuria must always be given proper consideration, when first noted.

CASE 3.—*History.*—A girl, aged 5, admitted, Dec. 16, 1921, complained of pain in the right lower abdomen. She had had three attacks of pneumonia, the last attack a year before. She had had pus in the urine for the last three years, for which she was being treated by her family physician, who diagnosed pyelitis. The present illness began two days before, with pain in the right lower abdomen, which was severe at times. She had had nausea but no vomiting.

* From the Surgical Service of Mount Sinai Hospital.
* Read before the Academy of Medicine, Cleveland, March 17, 1922.

Physical examination was negative except for slight tenderness in the right lower abdomen. There was no rigidity. The urine was loaded with pus cells. The roentgen ray revealed three shadows in the region of the left kidney. Cystoscopy revealed a normal bladder and normal ureteral orifices. One cubic centimeter of indigocarmin was injected intramuscularly. The appearance time on the right side was seventeen minutes, and on the left side, thirty minutes. The diagnosis was: renal calculus, left side. Pyelotomy was performed, and three stones were removed.

Comment.—This patient may or may not have had pyelitis primarily. It is safe to assume, however, that she had had renal calculus for a considerable time, because of the size of the stones and the length of time that pus was present in the urine. The pain in the right abdomen was in all probability reflex.

CASE 4.—*History.*—A man, aged 20, admitted, July 12, 1920, complained of marked urgency and frequency, accompanied by terminal pain. He had had hematuria six months before. The duration of the present symptoms was about six months. For the last year he had been treated for gonorrhea, although he denied ever having had a symptom of urethritis, aside from a slight burning at the end of micturition, for which he sought relief at that time. He had lost 50 pounds. The physical examination was negative. The urine showed many pus cells and a few red blood cells. Cystoscopy revealed marked inflammation of the bladder mucosa, with bullous edema, two large stones present making it impossible to catheterize the ureters. Suprapubic cystotomy was performed, and two stones were removed.

Comment.—A whole year was lost in this case through a wrong diagnosis.

CASE 5.—*History.*—A man, aged 24, admitted, July 21, 1919, complained of kidney trouble and pain on urination. The duration of symptoms was six or seven years. He had had occasional attacks of colic and several attacks of hematuria. He had had pus in the urine for the last three years, and was treated by many physicians for this condition during the last six years. Physical examination was negative except for tenderness over the left kidney. Cystoscopy revealed a mild inflammation of the bladder mucosa and turbid urine from the left side. Function was normal on both sides. The roentgen ray revealed three shadows in the region of the left kidney. The diagnosis was: renal calculus on the left side. Pyelotomy was performed, and three stones were removed.

Comment.—A much earlier diagnosis in this case would have been a simple matter.

CASE 6.—*History.*—A man, aged 36, admitted, Dec. 15, 1921, complained of hematuria and occasional pain in the region of the left kidney. The duration of the symptoms was ten years. He had been receiving treatment for this condition from various physicians. Physical examination was negative except for slight tenderness over the left kidney. The urine contained a large amount of red and white blood cells. Cystoscopic examination revealed a slightly inflamed bladder mucosa. Urine from the right side was clear, and from the left side, hemorrhagic. Indigocarmin appearance time on the right side was four minutes, and on the left side, fifteen minutes. Pyelograms revealed the left pelvis dilated and irregular, the calices indistinct and dilated. The right side was normal. The diagnosis was: tumor of the left kidney. Nephrectomy was performed. Instead of a tumor, a large calculus filled the entire pelvis and extended into the calices. For this reason and because the kidney was pale and soft, a nephrectomy rather than a pyelotomy was performed. Pathologically, the kidney showed a marked cloudy swelling and fatty degeneration, and a marked dilatation of the tubules.

Comment.—The mistake in the preoperative diagnosis as between tumor and calculus was an error in deduction, and yet, while the weight of the evidence was in favor of tumor, it is possible that a roentgen-ray examination prior to the cystoscopy and pyelography would have disclosed a shadow in the region of the left kidney. This, however, did not alter the surgical procedure. This patient was treated over a period of ten years, with medicines and bladder irrigations, no positive diagnosis being made.

CASE 7.—*History.*—A man, aged 34, complained of a urethral discharge for the last two years. He was treated continuously for gonorrhea. He denied exposure and had had no other symptoms of urethritis except discharge and occasional terminal hematuria. The discharge had always been thin and watery. He had pain in the lower back and a full feeling in the perineum. Physical examination was negative except for a slight mucoid discharge, which was negative for gonococci. Endoscopic examination disclosed the posterior urethra and the superior and lateral surfaces of the neck of the bladder studded with numbers of polyps. The upper urinary tract was negative. The tumors were fulgurized. Complete recovery ensued after seven treatments.

Comment.—I have seen fifteen cases like this one. Nine of the patients admitted having had gonorrhea, and five denied it, but all were treated for it.

CASE 8.—*History.*—A man, aged 24, admitted, May 21, 1918, complained of frequency and hematuria. About two months prior to this he was operated on for appendicitis because of pain in the epigastrium and because the roentgen ray revealed an obliterated appendix and a possible Lane's kink. The urine at this time showed a few pus cells. Two years before he was admitted he had a sharp, stabbing pain in the right lower abdomen which came on suddenly and lasted two days. He had had two similar attacks since. He had had urinary frequency since the first attack of sharp pain, two years before. Physical examination was negative. The urine contained a few red and white blood cells. Cystoscopic examination revealed a slightly inflamed bladder mucosa and a small calculus in the region of the left ureteral orifice. The urine from both sides was clear, and the functional test was normal. Cystoscopic removal of the calculus was effected.

Comment.—From the history and examination in this case, it is reasonable to assume that the attacks of pain described above were due to ureteral calculus and not to appendicitis.

Case 9 illustrates the application of modern urologic diagnostic methods in borderline cases in which it becomes necessary to rule out urologic conditions as a cause of particular symptoms, as well as differentiating interabdominal conditions.

CASE 9.—A woman, aged 20, referred by Dr. Theodore Miller because of a mass in the lower abdomen which felt like a kidney, had been pregnant three months. Physical examination revealed a kidney-shaped mass fixed to the second and third lumbar vertebrae and extending about a hand's breadth to each side of the median line. Cystoscopic examination was negative. Sodium bromid solution was injected, 11 c.c. on the right side and 9 c.c. on the left side. Pyelograms revealed the left kidney in the position corresponding to the mass felt on physical examination. The right kidney was in the normal position, but rotated so that the calices pointed inward rather than outward.

The advisability of determining what this mass was is apparent, and requires no further comment.

COMMENT

These are only a few of the cases that have come under my observation at the hospital during the last five years. They illustrate how generally physicians fail to take advantage of modern urologic diagnostic methods, such as cystoscopy, ureteral catheterization, renal function tests, pyelography and roentgenography. The sooner the profession realizes the importance of accurate diagnoses in these cases, the sooner will it learn that calculi, tumors, obstructions and malformations of the urogenital tract, as well as infection of the upper urinary tract, are not cured by urinary antisepsis, and washing out the bladder.

Furthermore, the earlier a urologic diagnosis is made, the less extensive will be the surgical procedure for its correction, with a much greater chance for a complete recovery.

Certain points remain to be emphasized. It should be borne in mind that this discussion excludes gonorrheal infection.

1. Valuable information is obtained in urologic cases from a careful examination of the patient, combined with a careful examination of the urine.

2. One should not treat every case of pyuria or hematuria, either with or without urinary disturbances, with drugs and bladder irrigations indefinitely.

3. Pus in the urine, blood in the urine and disturbances in the function of micturition are definite signs of a pathologic condition of the urinary tract that demand serious consideration.

4. Cystitis, so-called, is a symptom of some pathologic condition of the urinary tract and not a distinct entity.

5. By applying modern urologic diagnostic methods, a correct diagnosis can be made with a reasonable degree of certainty. Then and then only can this class of cases be treated along proper lines.

3912 Prospect Avenue.

THE SURGICAL TREATMENT OF GASTRIC AND DUODENAL ULCERS

WITH SPECIAL REFERENCE TO PYLOROPLASTY

J. SHELTON HORSLEY, M.D.
AND
WARREN T. VAUGHAN, M.D.
RICHMOND, VA.

The selection of the proper surgical procedure for the treatment of duodenal or gastric ulcers depends on some knowledge of the etiology of the ulcer, of the physiology of the stomach, and of the pathologic condition present.

It is undoubtedly true that many ulcers of the stomach or duodenum can be and are cured by medical measures, chiefly by diet. These cases, however, are usually the more recent ulcers. Operation is not advisable in an ulcer that has existed only a few weeks, unless some complication, such as hemorrhage or perforation, appears to threaten life. The old peptic ulcers that have become callous are not often cured by medical treatment, though the symptoms may be ameliorated and the patient's general health improved. The condition somewhat resembles ulceration in other portions of the body, as on the leg. When a recent injury has caused an ulcer, such a lesion does not require excision. If, however, there are varicose veins, and the ulcer has become indurated and has persisted for months or years, its surgical removal is indicated, together with correction of the underlying aggravating pathologic condition by excision of the varicose veins.

Medical treatment should go hand in hand with the surgical treatment. Surgeons and physicians can merely assist Nature. Suturing a wound is only a temporary aid, which apposes, immobilizes and rests the injured tissues; unless Nature unites the apposed tissues, they will fall apart when the stitches are removed, just as would two pieces of leather. In like manner, operations on the stomach should be followed not only by general rest in bed for a sufficient time, but also by local physiologic rest, which in this instance can be only partial, and is secured by a proper and scientific regulation of diet, so that the stomach receives only the necessary quantity of nourishment, administered in such a manner and at such times as will give it the least possible amount of work to do.

Living tissue cannot be treated in the same manner as inanimate things, and a recognition of the best means of giving a diseased organ rest, relative or absolute, is one of the greatest therapeutic resources in either medicine or surgery.

The etiology of ulcers of the stomach and duodenum has not been fully explained, though much light has been thrown on it. The work of Reeves [1] in demonstrating the peculiar arrangement of the vascular supply of the pyloric portion of the stomach and the first portion of the duodenum is interesting because this circulation seems favorable for the development of thrombi. The pyloric end of the stomach is equipped with strong and active muscles. The caliber of the stomach tapers off to the pylorus, producing more pressure and friction in this region. These facts, together with the sudden change in reaction from acidity in the stomach to alkalinity in the duodenum, doubtless influence greatly the formation of pyloric and duodenal ulcers.

Most gastric and duodenal ulcers seem to be hematogenous in origin. At the time of the formation of the ulcer there probably were other lesions, such as cholecystitis, pancreatitis and nephritis, which cleared up and left the ulcer as the sole surviving lesion. The work of Rosenow in this regard is exceedingly interesting. If, however, after other lesions have healed, the ulcer still exists, its elimination seems to be indicated.

The removal of a focus of infection has been emphasized in recent years. While this doctrine may occasionally have been carried too far, efforts made to remove any source of toxic absorption, no matter how small, are founded on correct principles. If the sepsis from an apical abscess of a tooth is a cause of a distant pathologic condition, certainly an ulcer of the stomach or duodenum, which is almost constantly massaged by peristaltic waves, cannot be overlooked as a source of toxic products.

The object of surgical treatment in these cases is to remove the pathologic condition and then to restore as far as possible the physiology of the stomach. These indications do not admit of any one standard type of operation in all ulcers. If an ulcer is in the body of the stomach, near its lesser curvature, a V-shaped resection is indicated. If the ulcer is extensive, and not malignant, a "sleeve" resection would probably give better eventual results than the removal of a large V-shaped section. Barber and others have shown that the "sleeve" resection apparently interferes less with harmonious peristalsis than the removal of a large V-shaped section from the lesser border. If the ulcer is very difficult to reach, the cauterization of Balfour should be done; or, if this is impossible, a pyloroplasty alone may benefit.

The removal of an ulcer from the posterior wall is best done by an incision through the gastrocolic and the gastrohepatic mesentery, according to the suggestion of W. J. Mayo. After the ulcer has been excised and the wound sutured, a piece of the great omentum can be fastened over the site of the excised ulcer for additional security and to prevent adhesions to the pancreas. Ulcers of the stomach near the pylorus, and ulcers in the first inch of the duodenum, may be treated by excision and pyloroplasty. If, however,

1. Reeves, T. B.: Surg., Gynec. & Obst. **33**: 374 (April) 1920.

there are multiple ulcers in the pyloric end of the stomach, or if they tend to recur, pylorectomy with the Billroth method of union of the duodenum and stomach, or the Polya-Balfour union of the jejunum to the stump of the stomach gives satisfactory results. These operations carry a higher mortality rate than the simpler pyloroplasty or gastro-enterostomy, though the pathologic condition present may cause them to be indicated on account of the better late results.

The most frequent site of ulcer is near the pylorus, either on the duodenal or on the gastric side. If the ulcers have resulted in cicatricial contraction and marked stenosis, the normal gastric or duodenal wall is replaced by an extensive scar, and it becomes impossible to restore physiologic function to tissue that has been thus permanently damaged. Here it must be determined whether it is wiser to attempt to restore a crippled outlet at the pyloric end of the stomach by doing a pyloroplasty, and so preserving the physiologic exit of the gastric contents, or whether it would be better to do a gastro-enterostomy because of the impossibility of restoring the pyloric function. J. M. T. Finney has very justly said that a gastro-enterostomy, like an amputation, is a confession of failure, and the problem may be likened to the question that sometimes arises as to whether we shall preserve or amputate a limb that has been permanently crippled.

CONDITIONS IN WHICH GASTRO-ENTEROSTOMY IS OPERATION OF CHOICE

There are three conditions in connection with ulcer of the stomach and duodenum in which it seems to us that gastro-enterostomy is preferable to pyloroplasty: (1) When there is an extensive stenosis, so that most of the normal tissue near the pylorus has been destroyed; (2) when there is a large ulcer in the first portion of the duodenum or in the pyloric end of the stomach, accompanied by extensive leukocytic infiltration, and especially if there is a subacute perforation; and (3) when adhesions are very extensive, especially with only slight disease of the gallbladder.

1. The first classification admits of little further discussion. In a narrow stenosis, with no adhesions, a pyloroplasty may be done with good results, but in extensive stenosis, pyloroplasty is not only difficult but unsatisfactory. If, however, there is bleeding accompanied by dense stenosis, it would be well to do a pyloroplasty in order to break the ring of cicatricial tissue and bring in normal duodenal and gastric wall which will drain away the venous blood. Contraction is likely to follow in these extensive stenoses, and a gastro-enterostomy should be performed at the same time.

2. Any large infiltrated ulcer near the pylorus, either in the stomach or on the duodenal side, will probably be followed by an eventual stenosis. Such infiltrated tissue does not hold sutures well, and gastro-enterostomy is here clearly indicated. If a perforation seems imminent, the gallbladder or a tag of omentum should be fastened over the site of the ulcer with catgut sutures.

3. When extensive adhesions exist, and the gallbladder shows but little disease, even removal of the gallbladder is often followed by adhesions of the duodenum to the liver, which provoke pain and distress and make the eventual results unsatisfactory. One of us[2] has recently elaborated this feature in discussing cholecystitis and duodenal ulcer. If the adhesions are mostly or entirely between the duodenum and the gallbladder, removal of the gallbladder with a pyloroplasty will usually be satisfactory. The gallbladder should be removed as gently as possible, and the stump of the cystic duct should not be drained, but preferably covered with a tag of omentum.

In gastro-enterostomy the strong peristalsis in the pyloric end of the stomach is diminished because a large portion of the food finds an easier outlet through the stoma of the gastro-enterostomy. Therefore, though the adhesions here will still exist, they produce no symptoms because they are not tugged at by the strong peristaltic waves; whereas, when all the food passes through the pylorus, the increased tugging on the peripyloric adhesions by the normal peristalsis causes discomfort.

WHEN PYLOROPLASTY SHOULD BE CHOSEN

The type of cases in which pyloric or duodenal ulcer exists, and the pylorus is open and there are no adhesions, clearly calls for a pyloroplasty. Acute perforations of small ulcers are similarly treated. This restores the stomach as nearly as possible to its normal physiologic condition. Also, when there is but little injury to the structures of the stomach or duodenum, as in a narrow stenosis, pyloroplasty is indicated. When the diseased condition of the stomach or duodenum is well localized, and can be completely extirpated or corrected without serious harm to the anatomy or function of the tissues, it would be as unwise to perform a gastro-enterostomy as it would be to amputate for a comparatively slight lesion of the leg. Moreover, it is in this type of case, in which the pylorus is open, that gastro-enterostomy gives the worst results. If we can extirpate the lesion and still find the organs from which it is removed in excellent condition, we should obviously reconstruct the tissues in as nearly normal condition as possible.

This, we think, is best accomplished by the pyloroplasty devised by one of us.[3] There are a few modifications of the original operation which have been described in subsequent publications.[4] The most important of these is the use of two tractor sutures instead of one, and the mere approximation of the cut edges of the tissue with the second row of sutures, instead of attempting to infold with the second row. Whatever infolding is done is accomplished by the third row of sutures.

When in doubt with a borderline case, it is better to perform a pyloroplasty than a gastro-enterostomy; for a secondary gastro-enterostomy is easier and safer than a secondary pyloroplasty accompanied by the uncoupling of the gastro-enterostomy and suturing the resulting wounds in the stomach and in the jejunum. Thus, in an acute perforation of a duodenal ulcer, pyloroplasty seems to offer the best immediate result, though, from the character of the lesion with its extensive peritoneal irritation, marked adhesions may occur and a subsequent gastro-enterostomy may sometimes be necessary to relieve symptoms.

Ulcers that are situated in the duodenum more than an inch from the pylorus do not admit of a pyloroplasty,

2. Vaughan, W. T.: Duodenal Ulcer and Cholecystitis, Virginia M. Month., April, 1922.
3. Horsley, J. S.: A New Operation for Duodenal and Gastric Ulcer, J. A. M. A. **73**: 575 (Aug. 23) 1919.
4. Horsley, J. S.: Ulcer of the Jejunum Following Gastro-Enterostomy, J. A. M. A. **76**: 354-358 (Feb. 5) 1921; Ann. Surg. **73**: 199-210 (Feb.) 1921.

but may be excised with a transverse incision and sutured, as practiced by E. S. Judd.

Whenever an operation for gastric ulcer is performed, whether by a "sleeve" or a V-shaped resection, a pyloroplasty should be done. This is necessary for the same reason that makes it wise to paralyze the sphincter ani when ulcers of the rectum are excised. The pyloric sphincter offers an increased resistance because of the irritation, and the stomach muscles, being weakened by the operation, can hardly overcome even the normal resistance. Therefore the pyloroplasty, which puts out of commission temporarily the muscular resistance of the pylorus, makes it possible for the injured stomach to empty its contents with a minimum exertion.

It seems, then, that gastric or duodenal ulcers can usually be treated satisfactorily by one of these types of operation. But the operation must fit the ulcer, and not the ulcer the operation. The presence of marked symptoms after gastro-enterostomy with an open pylorus has given the advocates of routine gastro-enterostomy in every ulcer much concern. The poor results in such cases are doubtless due to the action of the acid gastric juice on the mucosa of the jejunum, which is accustomed to alkaline contents. The alkalinity of the duodenal contents is lowered by the gastric juice, which enters through the open pylorus, but remains at its maximum when the pylorus is permanently closed by stenosis. In the latter condition, the high alkalinity may overcome the acidity of the gastric contents at the stoma of the gastro-enterostomy, and so protect the jejunal mucosa.

When the operative procedure has failed to give benefit in an individual case, it is safe to assume that the method was not the proper one for that case, and we should endeavor to find wherein there was a failure. It has been by such analysis that the general principles formulated above have been determined.

RESULTS

Up to April 19, 1922, we have performed thirty-nine pyloroplasties according to the technic referred to. In the first twelve there were three deaths, all of which we think would be now avoidable. There have been no other operative mortalities.

From July 1, 1921 to the present time (April 19, 1922) eight pyloroplasties have been done. So far as we know, all of these patients are doing well, except one who had an acute perforation of a duodenal ulcer, and now has "hunger pain." These eight operations, however, are too recent to be included in a statistical study of end-results. A few patients in the earlier group were not heard from when the summary of July 1 was made, but they had previously reported their condition, from a few months to a year after operation, as being satisfactory.

In cases of duodenal or pyloric ulcer, uncomplicated by adhesions or other pathologic condition in the right upper quadrant, simple excision with the pyloroplasty has apparently given 100 per cent. symptom-free cures. On the contrary, when, as often occurs, there were complicating adhesions between the duodenum and the gallbladder, and when these adhesions were merely separated, the results have been 66 per cent. unsatisfactory, and no case has remained entirely symptom-free. This has been true even though the gallbladder has appeared normal except for adhesions.

This fact having been recognized, if adhesions are solely to the gallbladder, we now remove such gallbladders at the original operation, with 100 per cent. symptom-free results. In one case, drainage of the gallbladder was unsuccessful, while subsequent cholecystectomy gave entire relief from symptoms. From this it would appear that removal of the gallbladder, together with such precautions to prevent the occurrence of adhesions as have been outlined elsewhere, is preferable to drainage.

We have found that if, in addition to adhesions to the gallbladder, there are adhesions elsewhere, as to the liver, which are not very extensive, cholecystectomy with separation of the additional adhesions and precautions against their recurrence will, as a rule, give satisfactory results. In a similar manner, light adhesions in this region, complicating duodenal ulcer, without involvement of the gallbladder, may be merely separated with quite satisfactory results. This has occurred even when the light adhesions involved the pylorus.

In most cases with adhesions to an otherwise apparently normal gallbladder, pathologic examination of that organ after removal will show it to be more or less diseased.

It has been a curious fact in our experience that when a duodenal ulcer with adhesions to the gallbladder was found and was treated by excision and pyloroplasty with merely separation of the adhesions, and when the symptoms have later returned, a subsequent cholecystectomy does not guarantee freedom from recurrence of adhesions and symptoms. In such cases it sometimes becomes necessary to perform a gastro-enterostomy. We have had one such case. When adhesions in the region of the pylorus and duodenum are very extensive, successful results can be obtained only after relative immobilization of this area by a gastro-enterostomy. In one case with gastric ulcer and extensive adhesions on the lesser curvature and slight adhesions near the pylorus, pyloroplasty alone gave perfect results.

In our series an important factor controlling successful results after pyloroplasty is not the recurrence of ulcer, but the development of peripyloric adhesions, and procedures toward eliminating the latter have been found to improve the ultimate results.

CONCLUSIONS

It is evident that stereotyped procedures have no place in the treatment of gastric and duodenal ulcer. Each case must be considered on its own merits. That there are early ulcers which can be successfully treated medically, no experienced internist or surgeon will deny. But because of this fact, one should not blindly endeavor to treat all ulcers solely by medical methods. As well attempt to cure an indolent ulcer of the leg by rest and elevation for twelve months or longer, when the same results can be more effectively accomplished in twelve days by the proper surgical procedure. There has been a tendency among internists to treat gastric ulcers only by medical methods, and among surgeons always to operate. The best interests of the patient require closer cooperation between surgeon and internist than has hitherto been the vogue. If it has been decided that a case should be treated surgically, the method best fitted to the condition found at operation should be chosen. Routine gastro-enterostomy in all ulcer cases will give as unsatisfactory eventual results as routine pyloroplasty. It is an unsuccessful workman who tries to accomplish all of his work with but one tool or method.

It must be remembered that the treatment of the patient with duodenal or gastric ulcer is not completed with the operation. Appropriate medical supervision should be continued for a long period to prevent additional damage. The patient's general condition must be studied and treated. Infection elsewhere should be eliminated. The patient's resistance must be built up and the diet carefully controlled to prevent renewed insults to the convalescing organ.

St. Elizabeth's Hospital.

RADIUM IN CANCER OF THE PROSTATE

A REPORT OF TWO HUNDRED AND SEVENTEEN CASES *

HERMON C. BUMPUS, Jr., M.D.
ROCHESTER, MINN.

The enthusiastic reports of results from the treatment of cancer of the prostrate with radium indicate the need of careful analyses of large series of such cases in which treatment has been carried out for several years.

There are records at the Mayo Clinic of 729 patients with carcinoma of the prostate; 217 of these have been treated with radium during the last seven years, and 363 have not been treated. The number of patients treated by radium is sufficiently large to afford valuable statistical data with regard to the treatment, and the patients who were not treated afford a record of the normal course of the disease, thus making a basis on which to compare results.

Before treating patients with carcinoma of the prostate with radium, or judging the results of such treatment, metastasis must be excluded. The frequency with which metastasis occurs in these cases is not fully appreciated unless routine roentgenograms are made. In 297 of the series, plates were made of

TABLE 1.—DATA ON 241 OF 363 PATIENTS WITH CARCINOMA OF THE PROSTATE NOT TREATED

	Patients	Per Cent.	Total Length of Disease, Months	Metastasis	No Metastasis	Length of Life After Examination, Months
Heard from.....	241	66.39	32.04	80	161	10.41
Dead.....	229	95.02	32.29	75	154	9.14
Living.....	12	4.97	22.83	5	7	34.5
Patients dead, 229						
Lived from:						
1 to 12 months	171	74.67	27.96	55	116	4.63
13 to 24 months	41	17.9	42.7	17	24	17.19
25 to 36 months	9	3.93	40.44	1	8	29.11
37 to 48 months	3	1.31	76.0	..	3	44.3
49 to 60 months	2	0.87	68.0	..	2	52.0
72 to 84 months	1	0.43	.....	..	1	78.0
Not stated.....	2	0.87	.....	2		
Patients living, 12						
Living from:						
1 to 12 months	7	58.33	21.83	5	2	9.42
13 to 24 months	1	8.33	.....	..	1	21.0
37 to 48 months	1	8.33	.....	..	1	41.0
49 to 60 months	1	8.33	.....	..	1	55.0
85 to 96 months	1	8.33	.....	..	1	90.0
133 to 144 months	1	8.33	.....	..	1	141.0

the chest, spine or pelvis, and in eighty-four (28.28 per cent.) metastasis was demonstrated, the greater number most commonly in the lumbar sacral region. Sixty-one of 218 roentgenograms of the spine and pelvis showed metastasis, and only eight of 169 roentgenograms of the chest showed metastasis. As a matter of fact, it is unnecessary to search the chest for evidences of metastasis, since it probably never occurs there unless it is also in the pelvis or lumbar spine. I have already [1] called attention to the fact that such metastasis often occurs without symptoms, before the appearance of cachexia, and in patients whose prostate glands are comparatively small. The detection of metastasis in 28 per cent. of all patients examined reduces materially the indications for radium treatment. From the facts that 73 per cent. of 113 patients with metastasis examined at the Mayo Clinic died during the ensuing year, and the average length of life after examination was seven months, it does not seem justifiable to treat a patient with radium simply for the local effect obtained on the original growth. Exception to this might be made if the local results of radium treatment could be depended on to relieve obstruction, diminish residual urine, or relieve pain. Although in

TABLE 2.—RADIUM TREATMENT IN PATIENTS WITH CARCINOMA OF THE PROSTATE

	Patients	Per Cent.	Average Length of Disease, Mos.	Average Mg. Hours Given by: Needles	Rectum	Urethra	Average Total Mg. Hours	Average Length of Life After Rtdium, Months
Heard from.....	152	70.04	40.65	1325.1	765.84	249.23	1694.2	15.0
Dead.....	118	77.63	37.76	1236.39	838.4	252.0	1634.34	12.36
Living.....	34	22.36	51.03	1597.77	535.58	244.75	1898.41	23.32
Patients dead, 118								
Lived from:								
1 to 12 mos.	72	61.01	33.86	1138.25	619.98	237.76	1429.5	6.77
13 to 24 mos.	26	22.03	41.0	1313.89	839.15	303.33	1644.53	17.34
25 to 36 mos.	10	8.47	52.75	2505.75	1488.2	219.0	2623.1	28.7
37 to 48 mos.	3	2.54	96.0	2062.0	3456.66	550.0	4327.3	41.33
Not stated..	7	5.93						
Patients living, 34								
Living from:								
1 to 12 mos.	9	26.47	29.02	1470.0	400.0	224.25	1358.22	8.77
13 to 24 mos.	12	35.29	55.54	1760.33	477.45	254.54	2431.33	18.33
25 to 36 mos.	8	23.52	51.85	1566.25	313.33	220.0	1923.75	29.5
37 to 48 mos.	1	2.94	96.0	1000.0	.....	.....	1000.0	45.0
49 to 60 mos.	4	11.76	71.33	1136.0	1300.0	400.0	1684.0	52.32

occasional cases benefit is obtained in one or more of these ways, our experience has not been such as to warrant giving radium for these conditions alone when there is no hope of prolonging the patient's life. A permanent urethral catheter or simple suprapubic drainage gives better immediate results and is less trying to the patient than are large doses of radium.

If patients with glandular metastasis alone are added to the 28 per cent. of patients whose metastasis is detected by the roentgen ray, it seems a conservative estimate that one third of all patients with carcinoma of the prostate will be unfit subjects for radium treatment because of metastasis. In the remaining two thirds, many complain of pain of recent onset, in the lower back, often with radiation down the outside of the thigh or around the hips. Such pain is pathognomonic of involvement of the lymph nodes of the sacral promontory and aorta which drain the prostate, and because of their deep-seated location are not demonstrable by physical examination. More often patients complain of recent attacks of sciatica, evidence of periprostatic extension of the malignancy. Our experience agrees with Barringer's,[2] that the irritation pro-

* From the Section on Urology, Mayo Clinic.

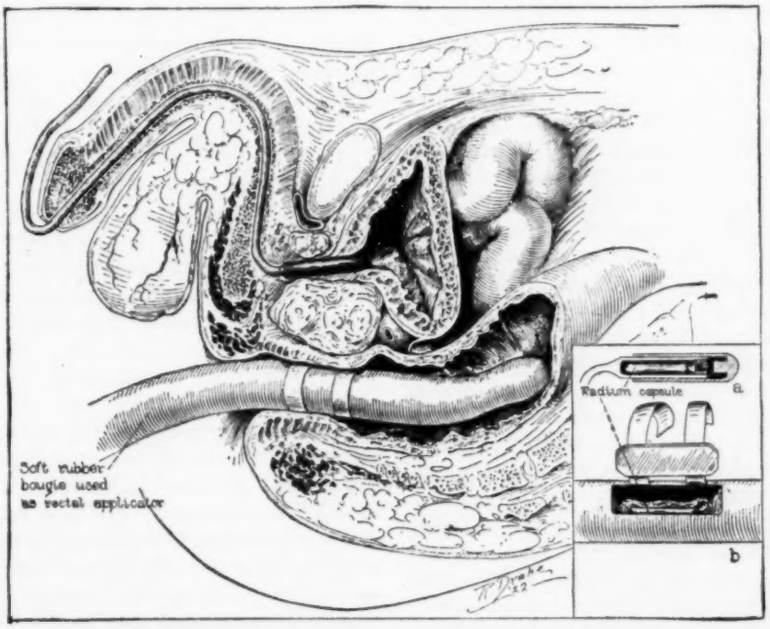
* Because of lack of space, this article is abbreviated in THE JOURNAL by the omission of three illustrations. The complete article appears in the author's reprints.

1. Bumpus, H. C., Jr.: Carcinoma of Prostate, Surg., Gynec. & Obst. **32**: 31-43 (Jan.) 1921; Radium Therapy in Cancer of the Prostate, M. Clin. N. Am. **5**: 707-712, 1921.

2. Barringer, B. S.: Radium in Treatment of Carcinoma of the Bladder and Prostate: Review of One Year's Work, J. A. M. A. **68**: 1227-1230 (April 28) 1917; Carcinoma of Prostate, Surg., Gynec. & Obst. **34**: 168-176 (Feb.) 1922.

duced by nerve pressure is uninfluenced by radium treatment, even if the tumor is considerably reduced in the prostatic area.

Besides patients with demonstrable metastasis are those whose renal function has been reduced by obstruction and whose general physical condition is such that treatment by radium is contraindicated. Such treatment is not without danger, and if sufficiently large doses of radium are given an added burden is necessarily thrown on the excretory mechanism. The tissue destroyed by the radium must be absorbed and eliminated, and if this task is added to an already deficient renal mechanism the result may prove fatal. Therefore, before undertaking the destruction of a malignant prostate by radium, the urea content of the blood should be determined and the usual tests of renal function should be taken as before surgical procedures. Small doses of radium may be given without great danger; but, if sufficient amount is applied, renal function must be adequate to handle the absorbed tissue. I believe that after excluding the several types of cases referred to, radium treatment will be indicated in considerably less than half of the cases examined.



Sagittal section of pelvis, showing solder urethral applicator and soft rubber rectal applicator in place; *a*, cross section of head of urethral applicator showing radium capsule and brass container with hard rubber shield in position for attachment; *b*, section of soft rubber bougie rectal applicator, showing window for carrying of radium capsule.

Often in reporting the results of treatment of malignant disease, emphasis is placed on the number of patients who have lived for an arbitrary period of years, three or five, such patients being referred to as three-year or five-year cures. It is disregarded that in every 100 cases of malignant disease a certain number of patients will live very much longer than the average duration of the disease. This is particularly true in cancer of the prostate, in which the malignancy may progress slowly. In the series of 363 untreated cases, ten patients have lived more than three years after the diagnosis of cancer without any form of treatment. The average length of the disease in this series was determined and used as a basis of comparison for the results of radium treatment. Likewise, the length of time the untreated patients lived after examination may be compared with the length of time the patients lived after having received radium. Successful radium treatment must inhibit the progress of the malignant process to the extent of appreciably prolonging life beyond the time the patient might be expected to live. Records concerning 241 of our 363 untreated cases show that the patients have lived on an average of ten months after examinations and that the total duration of their disease was approximately thirty-two months from the date of the first symptoms. These data are derived from a sufficiently large series to be considered significant, and will be used as a basis for comparison of results obtained by radium treatment.

The fact that radium emanation permanently destroys cancer cells is accepted. However, it is not so well understood that the effect desired is not complete destruction of these cells, with the resulting necrosis and slough, but disintegration of the nuclei so that they lose their power of reproduction. A dosage sufficient to cause this, rather than destruction of tissue, stimulates fibrosis and hyalinization, thus walling in the altered cancer cells, compressing them into distorted and flattened shapes, and preventing their further spread. In order successfully to treat prostatic malignancy, radiation must be brought into contact with every part of the growth. Success or failure depends on the ability to reach all parts of the neoplasm with a comparatively small dosage. To give one treatment and then advise the patient to return in two or three months for further treatment is illogical, since, if the malignant cells are reached by the first treatment, the second will be unnecessary. If the cells have not been reached, the length of time before the second treatment may permit the malignant process to extend beyond hope of cure or benefit. A second point against such series of treatment is the fact that the formation of the fibrous tissue diminishes the blood supply so that necrosis and sloughing are far more liable to occur after a second exposure. To illustrate this, I divided the 217 patients treated with radium into three groups: Group 1, patients treated by rectum and by urethra; Group 2, patients treated by needles inserted directly into the growth through the perineum; Group 3, patients treated by a combination of the two methods.

RESULTS OF TREATMENT

Group 1. The radium used was in the form of a 50 or 100 mg. capsule. At first a lead and brass shield was used in the rectal applicators; in the urethral applicators the standard silver container was the only filter. Both proved unsatisfactory, and, after several applicators had been tried, the following was adopted: A No. 10 soft rubber rectal bougie marked off in centimeters, with a window cut in the side to hold the radium tubes, is used in making applications by rectum. The size of the bougie keeps the rectal mucosa, except the area to be exposed, sufficiently far away to reduce the exposure to a minimum, and does not cause the secondary beta rays that occur when the metal shields are used. The bougie is inserted first so that the window is in the vesical area. Each hour it is withdrawn 1 cm. to

expose new areas of mucosa. This method has proved less irksome to the patient than a stationary applicator attached to bed or table. For urethral work, nothing has proved so satisfactory as a rubber covered brass receptacle attached to a piece of soft solder. The flexibility of the solder permits any curve of the prostatic urethra to be met, and enables the application to be applied at several areas. The applicator is withdrawn the length of the capsule each time, and the handle, bent over at the urethral meatus, affords fixity of position.

The amount of radium given by these methods has varied, since the treatments were given in the earliest cases. The rectal and urethral applications were alternated. The rectal dosage averaged 1,482 mg. hours, and the urethral 217. The rectal dosage represents overirradiation. Experience has since taught that from 400 to 600 mg. hours represents the maximum of safety in rectal applications, especially if needles have also been used and the mucosa thus cross-fired. However, fifty patients were treated by this method, and completed records have been obtained from forty. They lived an average of seventeen months after treatment, and an average of forty-five months after the onset of symptoms. The method was discontinued because of the proctitis produced by overdosage, and the method described by Dr. Barringer of the Memorial Hospital, New York, was adopted, that is, applying the radium directly to the substance of the gland by means of needles. The Memorial Hospital very kindly supplied us with such emanation-bearing needles.

Group 2. Thirty-seven patients were treated by inserting needles directly into the gland through the perineum. The average dosage was approximately 2,000 mg. hours. Completed records of twenty-seven patients show that they lived an average of fourteen months after treatment, and that the duration of the disease from the onset was forty-five months, slightly longer than the average for patients not treated. These poor results are explainable by the fact that by abandoning the rectal and urethral applications the periphery of the growth, where the greatest cell activity occurs, was not thoroughly irradiated. The needles were allowed to remain long enough in one location to destroy the malignant tissue immediately around them, but the tissue was only slightly affected beyond. The radium rays, like light, diffuse as they leave their source, and their effect diminishes progressively. Therefore, instead of stimulating fibrosis and hyalinization, the natural barriers of malignancy, destruction of only limited areas of malignant tissue had resulted. At the Memorial Hospital, New York, results of the work with buried emanation tubes have shown that 0.5 millicurie of emanation, when buried in tumor tissue, affects an area approximately 1 cm. in diameter, and that to increase this dosage to three or four times this amount does not increase the area irradiated appreciably, but causes marked destruction of cancer tissues with resulting necrosis. Each half millicurie emits 66 millicurie hours; this is equal to a needle containing 12.5 mg. radium in place for five hours. Therefore, keeping needles containing 12.5 mg. in one position for from twelve to twenty-four hours causes localized necrosis and sloughing. The desired minimal dosage is obtained by leaving a needle bearing 12.5 mg. of radium in one position for five hours, and then withdrawing it 12 mm., the length of the radium-bearing portion, in order to irradiate a second area 1 cm. in diameter. By using four needles at once and changing their position three times, twelve such areas, or twenty-four areas in two treatments, will be irradiated, affording approximately 1,500 mg. hours of irradiation. If to this, 600 mg. hours in the rectal exposure and 400 mg. hours in the urethral exposure are added, the maximum of malignant tissue is affected. In this way it is possible to avoid the necessity of giving from 4,000 to 5,000 mg. hours of exposure, with the danger of slough and fistula formation, and the so-called radium reactions incident to heavy dosage, which are really due to absorption of the toxic necrotic tissue destroyed. It has been our experience that approximately 2,500 mg. hours is the maximal dose that may be safely given, even in the largest glands, without producing sloughs.

Group 3. On the supposition that the poor results obtained from the use of rectal and urethral exposures alone, or from the use of needles alone, was attributable to the fact that not all of the cancer cells were reached by the radium emanations, the last 127 patients were treated by a combination of the three methods. The completed records of eighty-three patients show that the average dose of radium was 1,960.45 mg. hours. Sixty patients (72.28 per cent.) are dead; they lived an average of eleven and twenty-five hundredths months after treatment; 66 per cent. died the first year. The duration of the disease in the patients who died (thirty-three and sixty-seven hundredths months) is approximately the duration of the disease in the untreated patients; twenty-three (27 per cent.) are alive, the duration of the disease having increased to forty-seven and thirty-three hundredths months, and the time since their last treatment to twenty months, an extension approximately of one year in each.

Since only eight of the 217 patients treated with radium are alive after three years, it will be seen that the results are far from satisfactory. However, the average extension of life for one year as a result of the combined method of administration is significant, and demonstrates that by careful selection of cases and care in irradiating all portions of the gland, better results may be expected in the future. The fact that 27 per cent. of the living patients are now in their third year after treatment, and that a number do not show evidence of malignancy either by palpation or by symptoms, while only 8 per cent. of untreated patients survive to their third year, prevents the abandonment of this form of therapy. The results emphasize, however, that the treatment is applicable only to a selected few; to apply it to all patients with carcinoma of the prostate is to encourage false hopes and cause results disheartening to both patient and physician.

CONCLUSIONS

1. Radium therapy should be applied in less than one half of the patients with carcinoma of the prostate.

2. One third of all patients with carcinoma of the prostate will be found to have metastasis at the primary examination.

3. Complete and thorough irradiation of all portions of the neoplasm with minimal doses applied from many locations affords better results than maximal doses applied from a few locations.

4. Prolongation of life can be expected in only one fourth of the patients treated.

THE FUNCTIONAL CAPACITY OF THE HEART DURING HEMORRHAGE*

RUSSELL BURTON-OPITZ, M.D.
NEW YORK

The physiologic reactions to hemorrhage are so well known that they need not be discussed in detail at this time. Briefly outlined, they consist in (*a*) an increase in the frequency of the heart, which tends to maintain the general pressure by an augmentation in the cardiac output per unit of time; (*b*) a faster respiratory rate, increasing the ventilation in the lungs as well as the venous return, and (*c*) a constriction of the distal blood vessels, which diminishes the caliber of the vascular system and heightens the peripheral resistance. This change compensates for the gradual decrease in the viscosity of the blood brought about by the transfer of a certain quantity of lymph into the general vascular system.

The experiments of Johansson and Tigerstedt[1] are based on cardiographic readings, obtained by connecting the pericardial sac with a piston recorder. Wiggers[2] employed pulse pressure tracings in relation with records of the volume output of the heart as ascertained by means of a cardiometer. As a decided reduction in the filling power of the ventricles did not result until after the completion of a definite latent period, it was assumed by this author that the reduction in the venous inflow which one would naturally expect to develop after a hemorrhage is compensated for at first by a discharge of all superfluous amounts of blood from the venous cisterns. As has been pointed out by Krogh,[3] the portal system is peculiarly adapted to serve as a reservoir of this kind.

It seems, however, that the presence of venous cisterns is not essential to the preservation of the venous flow into the heart, because the evidence pertaining to the constriction of the peripheral vessels is sufficiently convincing to explain this phenomenon on this basis. Thus, Hooker[4] has recently succeeded in demonstrating a varying filling power on the part of the capillaries and venules, while Meek and Eyster[5] have shown by a similar method that an almost instantaneous whitening of the integument results when the hemorrhage has reached a certain stage. It appears, therefore, that the blood vessels of the integument respond actively at a certain stage of a hemorrhage in an endeavor to keep the circulatory conditions as near normal as possible.

Meek and Eyster have attempted to obtain a measure of the diastolic size of the heart and, therefore, of the cardiac filling by a series of examinations of the hearts of dogs by means of the roentgen rays. This procedure necessitated the taking of successive roentgenograms before as well as after definite amounts of blood had been withdrawn from the femoral artery. Care was taken to retain each animal in precisely the same position throughout the experiment. It was found that the diastolic size of the heart is maintained even after a considerable quantity of blood had been removed. Only after the average loss equaled 2 per cent. of the body weight or from 11 to 28 per cent. of the blood volume could a decrease of more than 5 per cent. in the heart's shadow be definitely established. When the loss of blood amounted to about 2 per cent., a rather sudden reduction in the diastolic heart size was noted.

The relative constancy of the shadow is supposed to show that the heart secures an adequate return of venous blood for some time after considerable quantities of blood have been removed. By inference it may then be concluded that the ventricles maintain their normal degree of distention under these circumstances. Their frequency of contraction remains practically the same until a considerable quantity of blood has been lost. It is obvious that a marked acceleration must definitely decrease the cardiac silhouette, although Meek and Eyster have also observed the latter phenomenon when not associated with acceleration. An explanation for this dissociation is not offered by these authors. It will become apparent in the course of this paper that it is due to a simple reduction in the filling of the heart.

This view, that bleeding impairs cardiac filling, has been advocated by Henderson,[6] Mann[7] and others, chiefly on the basis of cardiographic tracings. It is assumed that the peripheral circulatory channels are depleted, thereby rendering the venous return inadequate. Obviously, the cardiac output must suffer a corresponding diminution, because the increase in the frequency of the heart cannot compensate for the venous deficiency.

Several years ago I studied this particular subject-matter with the help of stereoscopic photographs of the exposed dog's heart taken at different moments of the cardiac cycle. The animal was placed horizontally, its heart being covered with a square frame of metal to which were fastened a number of cross wires at distances of 1 cm. from one another. These photographs showed that the lateral dimensions of the heart are only moderately shortened during hemorrhage. The organ as a whole, however, assumes a much softer consistency, permitting it to adjust itself more closely to the resistant surface of the spinal column. In order to avoid this mechanical effect, the animal was eventually placed in a nearly vertical position. The effects of gravity on the blood flow and pressure I sought to diminish by first establishing a direct communication between the carotid artery and jugular vein of each side, as well as by bandaging the abdomen.

These photographs did not show a significant reduction in the size of the diastolic heart, although the loss of blood amounted to about 1 to 2 per cent. of the body weight. More recently I have repeated these experiments on cats, outlining their hearts with the aid of calipers. While the results obtained with this method are not free from objections, owing to certain incontrollable errors in technic, it was easily noted that relatively large quantities of blood had to be withdrawn before an appreciable reduction in the size of the diastolic heart could be established.

It is generally stated that the rate of the heart is not materially increased until considerable amounts of blood have been lost. Accordingly, it might be assumed that the cardiac filling is not seriously impaired during

* From the physiologic laboratory of Columbia University.

1. Johannson and Tigerstedt: Skand. Arch. f. Physiol. **1**: 331, 1889.
2. Wiggers, C. J.: The Pathologic Physiology of the Circulation During Hemorrhage, Arch. Int. Med. **14**: 33 (July) 1914.
3. Krogh: Skand. Arch. f. Physiol. **27**: 227, 1912.
4. Hooker, D. R.: Am. J. Physiol. **54**: 30 (Nov.) 1920.
5. Meek, W. J., and Eyster, J. A. E.: Am. J. Physiol. **56**: 1 (May) 1921.
6. Henderson: Am. J. Physiol. **21**: 126, 1908. Henderson and Barringer: Ibid. **31**: 288, 1913. Henderson, Barringer and Harvey, Ibid. **46**: 533 (Aug.) 1918.
7. Mann: Bull. Johns Hopkins Hosp. **25**: 205, 1915.

the early stage of a hemorrhage. This retention of the venous inflow would enable the heart to preserve its normal outlines, thereby rendering the direct and indirect determinations of its volume practically valueless. During this early period the compensation would be effected by the peripheral vessels, i. e., by an active adjustment of their caliber to the quantity of blood still circulating.

The correctness of this assumption I have tested by the direct calibration of the venous supply of the heart and the simultaneous registration of the arterial and venous pressures. Large cats in ether narcosis were used for these experiments. The chest having been opened, a current measurer or stromuhr was inserted in the inferior vena cava in close proximity to the heart.[8] The arterial pressure was ascertained in the left carotid artery, and the venous pressure in the inferior cava centrally to the instrument measuring the blood flow. The record of a Jaquet chronograph served as the abscissa for these tracings.

TABLE 1.—RESULTS OF EXPERIMENT 2*

Phase of Stromuhr	Time, Sec.	Blood Flow, C.c.	Blood Flow, per Sec.	Blood Pressure, Mm. Hg: Carotid Artery	Blood Pressure, Mm. Hg: Inferior Vena Cava	Procedure
11	5.7	18.8	3.29	92.3	1.5	
12	5.4	18.8	3.48			
13	5.8	19.5	3.36	93.4	...	Loss of blood, 5 c.c.
14	6.0	19.5	3.25			
15	6.0	19.8	3.30			
16	5.9	19.8	3.35	92.0		
27	5.9	19.5	3.30	92.5	1.5	
28	6.0	19.5	3.25			
29	5.9	19.5	3.30	....	...	Repeated 1 minute later
30	5.9	19.5	3.30			
31	5.8	19.5	3.36	92.0		
32	5.9	19.5	3.30			
40	6.2	19.5	3.11	90.4	1.5	
41	6.1	19.5	3.19	....	...	Repeated 1 minute later
42	5.6	19.0	3.39	91.6		
43	5.7	19.0	3.33			
44	5.7	19.0	3.33			
45	5.6	18.5	3.30	90.5	1.5	

* Cat: weight, 4 kg.; heart, 22 gm.; frequency, 161 a minute.

The procedure followed in each of these ten experiments consisted in ascertaining the normal caval blood stream as well as the pressures before and after the withdrawal of varying quantities of blood. The blood was collected from either the left carotid or the left femoral artery. The hemorrhages lasted anywhere from a few seconds to several minutes. The quantity of the total amount of blood was estimated at one thirteenth of the body weight.

In Table 1 are presented the data pertaining to a portion of Experiment 2. They are intended to illustrate the effects of several slight hemorrhages repeated at intervals of one minute. It will be seen that these bleedings, amounting to 5 c.c. each time and to a total loss of 15 c.c., or to about 0.4 per cent. of the body weight, did not evoke clearly recognizable changes in the filling of the right auricle or in the height of the arterial and venous pressures.

As has been stated above, this adaptation of the system to the gradual loss of a relatively small amount of blood is said to be brought about by the constriction of the peripheral vessels and the transfer of a certain quantity of tissue fluid into the general vascular channels. It appears, however, that the second factor plays only a secondary part in the maintenance of the venous inflow. Thus, while the determinations[9] pertaining to the changes in the viscosity and specific gravity of the arterial blood after hemorrhage have shown that these factors suffer a clearly recognizable reduction in consequence of hemorrhage, the differences did not assume significant proportions at any time. The greatest diminution in the specific gravity amounted to 0.005, and the greatest reduction in the viscosity to 162.3 points. Furthermore, it required an interval of from twenty to thirty minutes before these changes could be clearly recognized by the methods at present at our disposal, and secondly, the most striking alterations appeared only after the amount of blood lost equaled from 20 to 30 per cent. of the body weight. Nevertheless, it seems certain that these reductions developed very shortly after the hemorrhage, and steadily increased up to the time when these viscosity determinations were made. If allowance is made for the progressive character of these changes, it will be seen that they cannot begin to influence the circulation in an effective manner until some time after the hemorrhage. Accordingly, since the experiments that I am here reporting were always completed within twenty minutes after the hemorrhage, this entrance of tissue fluid into the general vascular system cannot be the deciding factor in the maintenance of auricular filling after slight hemorrhages. The only other factor is the active regulation of the caliber of the peripheral vessels.

I am pleased to note that the more recent experiments of Scott,[10] Richet, Brodin and Saint-Girons,[11] and Meek and Eyster have yielded results which very closely agree with mine. Thus, Scott has found that, fifty-nine minutes after a hemorrhage of 206 c.c., the hemoglobin indicated an intake of only 23 c.c. from the tissues. Meek and Eyster, who finally resorted to determinations of the specific gravity by means of the method of Hammerschlag, report that, after hemorrhages equaling from 15 to 25 per cent. of the blood volume, this value showed a decline of only 0.002. Since this difference indicates a replacement of less than 5 per cent. of the blood volume, the inflow of tissue fluid cannot serve as a significant means of restoring the blood volume within the time required for the completion of these experiments.

TABLE 2.—RESULTS OF EXPERIMENT 6*

Phase of Stromuhr	Time, Sec.	Blood Flow, C.c.	Blood Flow, per Sec.	Blood Pressure, Mm. Hg: Carotid Artery	Blood Pressure, Mm. Hg: Inferior Vena Cava	Procedure
15	6.0	18.5	3.08	94.6	1.0	None
16	6.0	18.5	3.08	....	1.2	
17	6.4	19.5	3.04			
18	6.2	19.5	3.14			
19	6.0	19.0	3.16	89.2	1.0	Loss of blood, 40 c.c.; frequency, 182
20	6.4	19.0	2.96			
21	7.0	19.0	2.71			
22	7.0	19.0	2.71			
23	7.2	18.8	2.61			
24	7.0	18.8	2.68			
25	7.1	19.0	2.67	92.0	1.0+	
26	6.4	19.0	2.79			
27	6.4	18.5	2.90			
28	6.2	18.5	2.98	92.5		
29	6.4	18.8	2.96	....	...	Loss of blood repeated

* Cat: weight, 3.8 kg.; heart, 20 gm.; frequency, 162 a minute.

In Table 2 are presented the data pertaining to a section of Experiment 6. They are intended to illustrate the changes resulting in consequence of hemorrhages amounting to about 1 per cent. of the body weight. Table 3 gives the results of continuous hemorrhages, amounting finally to more than 50 per cent. of the total amount of blood.

8. Burton-Opitz, R.: Am. J. Physiol. **58**: 226 (Dec.) 1921.
9. Burton-Opitz, R.: Arch. f. d. ges. Physiol. **82**: 31, 1900.
10. Scott: J. Physiol. **50**: 157, 1915.
11. Richet, Brodin and Saint-Girons: Comp. rend. Acad. d. sc. **166**: 587, 1918.

It will be seen from these tables that the frequency of the heart increases appreciably when the loss of blood reaches a value approximately 0.5 per cent. of the body weight. From now on may also be observed a slight reduction in the venous supply of the heart and venous pressure. The carotid pressure also presented a general decline, although it rarely assumed the value of 10 mm. of mercury. This second stage of the hemorrhage was usually initiated by a brief period during which the systolic pressure rose slightly above normal, this augmentation being due in all probability to the greater cardiac rate and still adequate vasomotor compensation. It should also be noted that the bleeding from the carotid artery proved more effective than that from the femoral artery.

TABLE 3.—RESULTS OF EXPERIMENT 8*

Phase of Stromuhr	Time, Sec.	Blood Flow, C.c.	Blood Flow, per Sec.	Blood Pressure, Mm. Hg: Carotid Artery	Blood Pressure, Mm. Hg: Inferior Vena Cava	Procedure
5	6.8	19.0	2.79	98.6	2.0	None
6	6.8	19.0	2.79			
7	6.9	19.0	2.75			
8	7.1	19.5	2.74			
9	7.2	19.5	2.70			
10	6.9	19.5	2.8?			
Average			2.76	98.6	2.0	Hemorrhage, continuous, from femoral artery
11	7.0	19.5	2.77			
12	7.0	19.5	2.77			
13	6.8	18.8	2.76	102.3	2.0+	
14	6.7	18.8	2.77			
15	6.9	19.0	2.75	100.6		
16	6.7	19.0	2.83			
17	6.7	19.0	2.83			
18	6.8	19.0	2.79	97.5	2.0—	
19	6.9	18.8	2.72	....	...	Loss of blood, 20 c.c.; cardiac rate, 165
20	6.9	18.8	2.72	94.6		
21	7.0	18.8	2.68			
22	7.2	18.8	2.61	92.4	1.0	Loss of blood, 40 c.c.; cardiac rate, 176
23	7.5	19.0	2.58	86.7		
24	8.0	19.0	2.37			
25	8.0	19.5	24.3			
26	8.5	19.5	2.29	72.8	0.5	
27	8.8	19.5	2.21			
28	10.5	19.5	1.85	64.0	...	Loss of blood, 80 c.c.; cardiac rate, 189
29	10.0	18.8	1.88			
30	10.0	18.8	1.88			
31	12.0	19.5	1.62	54.1		
32	12.2	19.5	1.59			
33	12.8	19.5	1.52	50.3	...	Loss of blood, 120 c.c.; cardiac rate, 185
34	12.9	19.5	1.51	....	0.5—	
35	12.6	18.8	1.49			
36	15.4	18.8	1.22			
37	16.3	19.0	1.16	36.2	...	Loss of blood, 160 c.c.; cardiac rate, 52
38	17.5	19.0	1.08			
39	17.6	19.0	1.07			
40	10.5	19.0	1.80	64.5	1.5	Injected an equal quantity of saline solution, repeated experiment
41	7.5	19.0	2.53	84.6	1.5+	
42	7.4	19.0	2.54			

* Cat: weight, 3.8 kg.; heart, 20 gm.; frequency, 158 a minute.

Recovery of the normal was usually complete within five minutes after a small hemorrhage. As has been stated above, this compensation should be ascribed to vascular adaptations and not to a replacement of the blood lost by an equal amount of tissue fluid. The fact that these small hemorrhages actually gave rise to a clearly recognizable diminution in the venous return, and did not lead to an appreciable reduction in the size of the heart as ascertained by means of the stereoscope, calipers and roentgen rays, proves convincingly that the planometric alterations in its mass are counteracted by certain peculiarities in its structure. In other words, the factor which should be held responsible for the retention of the contours of this organ after hemorrhage is resident in its tissues and not in the peripheral circulation. Clearly, our inability to discern planometric differences in the heart after a moderate hemorrhage cannot be ascribed to a maintenance of ventricular filling, because the present experiments show that the venous supply is diminished. Since the heart endeavors to compensate for this deficiency by contracting more frequently, its output per beat must become smaller, although its total discharge per unit of time need not be reduced until the venous return has been materially decreased.

While cardioplethysmographic tracings are by no means free from objections, because they cannot be employed as a direct measure of the ventricular output, it is of interest to note that Henderson, as well as Meek and Eyster, has succeeded in demonstrating recognizable reductions in the volume curve of the heart of dogs at a time when the hemorrhage amounted to less than 1 per cent. of the body weight. Obviously, the cardiograph is a more suitable instrument than are planometric appliances for detecting these volumetric changes. It more clearly depicts those alterations in the mass of the heart which arise in consequence of a general loss of its compactness.

Continuous slow bleeding produces finally the same results as an equally severe rapid hemorrhage. The initial reduction in the venous return, which becomes clearly apparent when the loss of blood reaches the value of 0.5 per cent. of the body weight, is associated with an increase in the frequency of the heart. The latter persists until the arterial pressure has reached a level about one third of normal. It is obvious that the impaired filling of the auricles cannot be fully compensated for by the increase in the cardiac rate, and, hence, the output per beat and per unit of time must finally be greatly diminished. Thus, while the arterial pressure is well retained during the early stages of a hemorrhage, and may, in fact, rise a few millimeters above normal, it must decrease as soon as the filling of the cardiac chambers has been seriously impaired. In the experiments here under discussion, this decompensation set in when the loss of blood equaled about 1 to 1.5 per cent. of the body weight, or slightly less than one fourth of the total amount of blood.

The second stage of a hemorrhage is followed by a period during which the decompensation continues until the gradual loss of blood to one third and one half of the total quantity causes the venous supply to suffer a corresponding decrease. A steady decline of the carotid and venous pressures to about one third of normal are the most evident symptoms of this stage. The mucous membranes whiten perceptibly at the beginning of this stage, when the loss of blood approximates one fourth of the total.

One may also recognize a fourth stage of hemorrhage. It is characterized by the symptoms of cardiac failure. The heart then reveals a marked diastolic tendency, which is associated with very low arterial and venous pressures. In the experiment here cited, the amount of venous blood returned to the heart through the inferior cava during the third stage measured only 1.22 c.c. a second, as against the normal volume of flow of 2.76 c.c. a second. This decline continued steadily until the frequency of the heart had been reduced to about 50 beats to the minute and the caval blood stream to 1.06 c.c. a second.

It has long been recognized that the phenomena of dyspnea and asphyxia may be closely imitated by bleeding. It is easily conceivable that the results of a diminished venous supply of the heart affect the oxidations of the tissues essentially in the same manner as mechanical and chemical interferences with pulmonary ventilation. Stress has also been placed on the fact that the movements of respiration, and the changes in intrathoracic pressure evoked thereby, serve as a distinct aid to the return of the venous blood and, hence,

also to the cardiac output. The changes in the character of the respiratory movements observed during hemorrhage are so well known to the clinician that they need not be enumerated in this place. Their purpose is to augment the total quantity of the respiratory air in an attempt to overcome the diminished venous supply and arterial discharge of the heart occasioned by the hemorrhage.

In the experiments here under discussion, the respiratory factor has been eliminated by the opening of the chest and the institution of rhythmic artificial respiration. It is obvious, however, that normal respiration cannot materially alter the effects of hemorrhage as outlined above, because the respiratory movements usually pursue a course parallel to the action of the heart.

Since these experiments furnish direct proof for the view that the venous supply of the heart is diminished during hemorrhage, the conception of Zuntz [12] and his pupils, tending to equip the heart with the power of altering its amplitude of contraction independently of its rate, so as to retain its normal output, cannot be seriously considered in this connection. Under the conditions described above, the heart cannot continue to discharge normal quantities of blood, because, quite aside from its diastolic capacity, it cannot obtain the amount of venous blood required for its proper filling.

DISEASE OF THE OTOLITH APPARATUS

REPORT OF CASE *

ROBERT J. HUNTER, M.D.
PHILADELPHIA

It has been thought that the semicircular canals have to do with the perception of rotatory movements, and that the otolith organs have to do with the perception of rectilinear motion. A concept which has not been fully established by experimental data is that the flow of the endolymph induced by rotation causes a displacement of the cupola on the crista ampullaris of the canal or canals affected, and that this in turn stimulates the nerve endings, which have been shown to terminate there. It is a fact, however, that we have in the inner ear an organ which is stimulated by motion either increasing or decreasing in speed, but which ceases to be stimulated when speed is maintained at a constant rate. If the rate of movement has been more rapid than a person is accustomed to, when movement begins to get slower or ceases he has a false sense of motion in the opposite direction. This can be demonstrated easily by rotating a subject with the eyes shut, in a well balanced, smoothly working chair, taking care to exclude any auditory or visual stimuli, which would give him a clue, and instructing him to tell the direction in which he is going. As we rotate him, let us say, to the right, he says correctly "To the right, to the right." When, however, we maintain a constant speed for a few seconds he says, "I am not moving." As soon as we begin to retard the speed, he feels that he is moving to the left, although he is still rotating to the right. The same phenomenon of false sense of being still, or of motion in the opposite direction during retarding movement, or when progression ceases, has been shown to exist with rectilinear motion by experiments in elevators or moving trains. In this case, the thought has been that the perception apparatus was in the otolith membranes of the maculae of the utricle and saccule, and that the force of gravity on the otoliths was the activating stimulus.

Another function of the vestibular apparatus that has been noted in many of the earliest researches is that from it go a constant stream of tonic impulses which help us maintain our position in space or which enable us to orient our position in space. Many observers have noted that the destruction of the vestibular apparatus is accompanied by characteristic postures of the animals, and by changes in the position reflex of the eyes. Recently, de Kleijn and Magnus [1] have continued the research instituted by Wittmaach in 1910 by rotating animals in a centrifuge at 2,000 revolutions a minute, and thus dislocating the otoliths in the otolith membranes. By examining the reflexes of the animals before and after rotations, and by examining the otolith organs histologically, after rotation, they have come to the conclusion that it is the otolith organs exclusively that are concerned in sending out these tonic labyrinth reflexes to the body muscles and in the maintenance of the position reflex and compensatory eye movements. They conclude that the otolith apparatus is not stimulated by centrifugal force or, in the case of rectilinear motion, by any lagging of the otoliths on progression, and they call attention to the fact that, in the case of the canals, the stimulus is on movement either starting or stopping, whereas in the otolith membranes the stimulus is constant from the time the head moves from the horizontal position, and they think it quite likely that even in that position there is a constant minimum stimulus for tonus. In support of this, they quote cases in which extirpation of the labyrinth resulted in the head being held to the normal side, but in which extirpation of the remaining labyrinth, many months afterward, resulted in the head taking a median position again, owing to the cutting of the constant impulses from the good side. They have shown that the maximum impulse occurs when the otoliths hang from the maculae, and the minimum impulse when the otoliths press on the maculae, excepting in the case of certain eye reflexes and flexor muscle reflexes, when the opposite seems to be true. If this is the case, then disease of the otolith organs would cause physical signs, which are to be induced by the position of the head, rather than by rotation of the head.

De Kleijn and Magnus have also investigated the functions of the semicircular canals after destruction of the otolith membrane by centrifuging, and find that the turning reflex and after (nach) reflex, as well as the progressive movement reflexes, are present, and they conclude that these are activated by the semicircular canals. As these reflexes remain after extirpation of the cerebrum, most of the cerebellum and the afferent nerves of the muscles affected, they conclude that the centers are in the brain stem. As stated before, the theory of flow of the endolymph has not been fully accepted, the argument being that the canals are extremely small, that currents in the utricle or saccule, on account of their greater relative size, are much more likely to occur, and that it is not possible physically to create a flow in an unyielding cavity filled with fluid. Accordingly, at their suggestion, a model was made of glass representing the bony labyrinth with a projection at one side, covered with a sheet

12. Zuntz: Ztschr. f. klin. Med. **74**, Nos. 3 and 4, 1912.

*Read before the Philadelphia Neurological Society, Feb. 24, 1922.

1. De Kleijn, A., and Magnus, R.: Arch. f. d. ges. Physiol. **186**: 6-60, 61-81, 1921.

of rubber to provide elasticity and represent the connection of the perilymph with the fenestrae ovalis and rotunda. Inside this glass model of the bony labyrinth they have placed a rubber model representing the membranous labyrinth having a glass ampulla, in which is located a small elastic cupola and hair cell. This membranous labyrinth has an opening in the glass or bony labyrinth leading to a rubber bag, representing the saccus endolymphaticus. Having filled the models with fluid, they have moved it back and forth and observed movements of the cupola, and they feel that they have shown it physically possible that the semicircular canals can be stimulated on rectilinear motion. For reasons that I shall not state in detail, however, they conclude that from their experiments on guinea-pigs, although the progressive reflexes remain after extirpation of the otolith membrane, they are not willing to say that the otoliths do not participate to some degree.

Some interesting work on the dogfish, which has an easily accessible labyrinth in which the otoliths or the ampullae can be destroyed without injury to other parts, has been done by Maxwell.[2] He concludes that most of the reflexes are activated by both the semicircular canals and the utricle, and finds them destroyed only when both organs are extirpated. He believes that the saccule has nothing to do with equilibrium. This may be true of fishes, but not of the higher vertebrates. He also believes that the canals are stimulated not by the flow of endolymph, but by the pull of the utricle on the ampullae.

Bárány [3] has reported a case of disease of the otolith apparatus; it is the only one I have been able to find:

A woman, aged 27, had had a headache for a year. The hearing, caloric reaction and neurologic conditions were normal. She had had vertigo for fourteen days, but only when lying on the right side. During the attacks there was marked rotary nystagmus to the right, with an upward directed vertical component. The nystagmus became purely rotary when the patient directed the eyes to the right, and purely vertical when she directed them to the left. It was position and not movement that caused the nystagmus. If, immediately after the cessation of an attack, the head were again turned to the right, no such phenomena could be induced, and it was necessary for the patient to lie on the back on the left side for a while before these results could be obtained again. The nystagmus began when the head was inclined even the slighest degree to the right.

No doubt, these cases are not infrequent, but have not been sought for.

REPORT OF CASE

The case that I report differs from the one reported by Bárány, but is, I believe, due to injury of the otolith apparatus.

C. C., a boy, aged 14 years, referred to me at the Lankenau Hospital, had never had convulsions or any other illness, with the exception of the present complaint. He was the seventh of nine children. The mother and father were healthy. He struck his head in a fall when 1 year old. At the age of 2 years he had a bad fall, cutting the right eyebrow. He received a severe blow, but was not unconscious. Some years later he was hit with a baseball, and later had a fall on the ice. The mother had not noticed that he was ungainly or had any peculiarity in walking or tendency to fall more than the other children. No one in the family had a similar complaint. The mother noticed that he held his head toward the side soon after he had had the blow on the head at the age of 2 years, and he had continued to do so ever since. She thought that the nystagmus grew worse when he became excited. The patient presented as his most prominent physical sign a marked horizontal nystagmus, with excursions varying greatly. The nystagmus was horizontal when the head was held with the horizontal semicircular canals parallel to the floor. In this position, with a pencil held at or near his near point, the movement was so small and fine that it was difficult to describe its direction. When asked to look to the right, he had horizontal nystagmus to the right, which was quick and of small amplitude. When asked to look to the left, he had horizontal nystagmus to the left. That is to say, the quick component was to the left on looking to the left, and to the right on looking to the right. The amplitude was greater, but the frequency was less, when he looked to the left. When asked to look to a distant point, he had marked horizontal nystagmus, which was very quick, of good amplitude and with the quick component to the left. The patient stated that when he looked at an object close at hand he had noted that the violent movement stopped. He had also noted that, if he put his head to the left side about 15 degrees, the nystagmus stopped. When he held his head straight or looked at a distance, he became dizzy and sick at the stomach. He defined dizziness as a state in which objects moved back and forth. He said that the room did not go round. When he looked up, the nystagmus continued to be horizontal and to the left. When he looked down, the nystagmus was very slight. When he read a book, the nystagmus was very slight, if he held his head to one side. He did not have these attacks when in bed. He had not noticed what effect shutting the eyes would have. With eyelids gently closed and the head 30 degrees forward, both eyes appeared to be turned inward and slightly upward. When the eyelids were raised during forcible closure, the eyes were looking straight ahead, and then turned upward and outward.

The position of the head which the patient found most comfortable was with it inclined to the left shoulder and with a line from the external auditory canal to the external canthus, 30 degrees upward, that is, the head upright and the right chin rotated 10 degrees to the left. When told to look at a distance with the head in this position the eyes oscillated very slowly and slightly, it was impossible to say in which direction. He still showed some nystagmus on looking to the right, and to the left on looking to the left with the head held in this position. With his head 60 degrees back, he held his eyes still for several seconds, when they oscillated again. With his head either over to the left or over to the right shoulder, he could hold the eyes almost still. With his head 30 degrees forward he had spontaneous past-pointing when taken in the perpendicular plane of 2 inches to the left with the right arm, and 3 inches to the right with the left arm. With his head in the same position, the past-pointing in the horizontal plane gave 2 inches below with the right arm and touched with the left arm. With his head 60 degrees backward he touched normally when moving the arms in the perpendicular plane, and the same when moving the arms in a horizontal plane. With his right leg (when the head was 30 degrees forward) he spontaneously past-pointed to the right. With the left leg he touched normally. When the head was 60 degrees backward he touched with both feet.

With the head held in the patient's "favorite position," he past-pointed normally, with his arms moving in the perpendicular plane, and also with his arms moving in a horizontal plane. With the right leg he was a little uncertain in pointing, going sometimes to the right and sometimes to the left. With the left leg he touched.

Station was perfect. Gait was normal. Gait was normal walking to an object 15 feet away with the eyes shut. When his head was held 30 degrees forward, the eyes being shut, he walked to the right sometimes, and sometimes he touched.

Several teeth were decayed. Both ear drums were retracted. There was an old scar in the posterior quadrant of the right side. Hearing was normal.

Caloric test of the right ear, with water at 68 F., revealed rotary nystagmus, small amplitude in forty-five seconds. Horizontal nystagmus was marked. Past-pointing was normal for all pathways. Caloric test of the left ear, with water at 68 F.,

2. Maxwell, S. S.: Removal of Otolith Organs, J. Gen. Physiol. **2**: 123 (Nov.) 1919; Static Labyrinth, J. Gen. Physiol. **2**: 349 (March) 1920; **3**: 157 (Nov.) 1920.

3. Bárány, R.: Hygiea **83**: 81 (Feb. 14) 1921; J. Laryng. & Otol. **36**: 229 (May) 1921.

revealed rotary nystagmus, small amplitude in forty-five seconds. Horizontal nystagmus was marked. Past-pointing was normal for all pathways. There was marked nausea and vertigo with each ear.

The rotation test was made one week after the caloric test. Rotation, ten turns to the right in twenty seconds, gave horizontal nystagmus to the left with marked excursions. This nystagmus would keep up indefinitely, but I am sure, from the change in rapidity and amplitude, that he got a stimulus through. There was marked sense of vertigo.

Rotation ten times to the left in twenty seconds gave nystagmus to the right. The amplitude was small. The excursions were rapid. After thirty seconds the nystagmus reversed and became the usual constant type seen in the patient. Just as the nystagmus reversed, the patient said, "The objects are not moving," and as the usual constant nystagmus started again he said, "There they start again." There is no question that he got a stimulus through. Vertigo was marked.

Rotation ten times to the right in ten seconds gave past-pointing to the right with the right arm 1 inch two times, and past-pointing to the right with the left arm 2 inches three times. There was marked nausea.

Rotation ten times to the left in ten seconds gave very marked nausea; the patient was distracted. He touched with the right arm and past-pointed to the left with the left arm 1 inch.

After a short rest this test was repeated, and he past-pointed 3 inches to the left with the right arm, and touched with the left arm. The patient vomited.

The rotation tests disclosed that impulses went through all pathways and were of usual intensity.

The patient consulted the eye dispensary of the Lankenau Hospital, Dec. 14, 1921, for the relief of asthenopic symptoms. He had never worn glasses. Examination by Dr. A. C. Sautter disclosed a lateral nystagmus which, the patient stated, had existed since birth. This nystagmus was most pronounced while fixing a distant object. With his head turned to the left, nystagmus was much less marked, and vision tested with the head in this position equaled 6/6 in each eye. Direct vision in each eye equaled 6/30 of the normal. Ocular excursions were full in all directions, and accommodation and convergence were normal. The corneas were clear, pupils 4 mm., irises reacting normally. Ophthalmoscopic examination revealed in each eye clear media and healthy eyegrounds. The refraction was taken with the aid of scopolamin, but no lens improved vision; consequently, no glasses were prescribed. Neurologic examination by Dr. Potts was negative.

COMMENT

The interesting points in this case are: (1) the history of incidence of nystagmus after a blow; (2) the significant fact that this had continued twelve years, and that except in his "favorite position" the nystagmus was constant and that there had been no vicarious assumption of function, such as we find after injury to the semicircular canals; (3) the most interesting feature, that the nystagmus was almost entirely absent in his "favorite position," but resumed instantly as soon as the head was moved from this plane, no matter how slowly and carefully it was moved, and at the same time the past-pointing, which was normal in his "favorite position," became abnormal in other positions. It seems to me that this points toward an injury of the otolith apparatus which was probably on the right side; the left side, maintaining tonus, caused the head to be drawn to the left. It is probable that this posture, according to the theory of Magnus and de Kleijn, places the otoliths in a position of pressing on the maculae, and therefore gives a minimum stimulus. As the otolith organ on the opposite side is nonfunctioning, we have the normal opposing muscle tonus of the neck muscles removed; and the head took that position when at rest. We also have the nystagmus due to the unopposed influence of the normal side.

On the other hand, many cases of unilateral destruction of the labyrinth, we have seen, must also have included the otolith apparatus. If this is so, how is it that we do not more often see the head going to the opposite side? Would the destruction of the canals in addition to the otolith apparatus be sufficient to cause this? The fact that the amplitude of the nystagmus is very marked on looking to a distance and is controlled by looking at a near point is in keeping with what we know of nystagmus after rotation.

1825 Chestnut Street.

SUBACUTE MALIGNANT INFLUENZAL ENDOCARDITIS

REPORT OF CASE*

J. B. COHEN, M.D.
AND
DAVID GREENBERG, M.D.
NEW YORK

The subject of subacute bacterial endocarditis is of interest because, of all the various types of endocarditis, it is the only one with a definite etiology, and further, because it manifests itself in a fashion making clinical recognition more or less certain. Frequently, however, a departure from the usual picture is encountered, as regards both the causative bacterial agent and the clinical phenomena. Thus, while the usual microorganism is *Streptococcus mitis* (*Streptococcus viridans* or nonhemolytic streptococcus), the influenza bacillus may be responsible for an identical picture. Libman and Celler,[1] in their exhaustive studies on the subject of subacute bacterial endocarditis, mention the influenza bacillus as being responsible for about 5 per cent. of the cases. More recently, Malloch and Rhea[2] reported two well-studied cases. The literature, however, is rather meager as far as influenzal subacute endocarditis is concerned, and for this reason it was thought worth while reporting this case.

REPORT OF CASE

History.—S. F., a man, aged 45, salesman, was admitted to Lebanon Hospital, July 24, 1921, complaining of chills, fever, and sweats. The family history was negative, and his previous history was irrelevant, except for a "cold in the head," three months prior to the present illness. Eleven days before admission he had a chill, followed by fever, and sweats. These symptoms occurred every other day. He also complained of weakness and lassitude, but had no pain. The fever for the first week was intermittent, and later remittent, ranging between 103 and 104 F.

Examination.—The patient was well built and obese. He did not look very ill. There was a slight icteric tinge to the skin and sclera. The head and neck were normal. The chest showed moderate emphysema; the heart sounds were not well heard (emphysema?). The liver and spleen were palpable but not tender. The pulse was 100, respiration 24, and temperature about 103 F. Prior to admission, the blood was repeatedly examined for malaria, and was negative. The urine showed red blood cells on several occasions as well as a faint trace of albumin, with an occasional hyaline and granular cast. A blood examination on admission to the hospital revealed: erythrocytes, 5,104,000; leukocytes, 11,600; polymorphonuclears, 81 per cent.; lymphocytes, 19 per cent.; hemoglobin, 100 per cent. The urine showed again a faint trace of albumin,

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* From the Medical Service and Pathological Department of Lebanon Hospital.

1. Libman and Celler: Observations on Etiology of Subacute Infectious Endocarditis, Tr. Am. Phys. **25**: 5-19, 1910; Etiology of Subacute Infectious Endocarditis, Am. J. M. Sc. **140**: 516, 1910.

2. Malloch, A., and Rhea, L. J.: Two Cases of Endocarditis Due to Bacillus Influenza, Quart. J. Med. **12**: 174 (April) 1919.

an occasional leukocyte, occasional hyaline and granular casts, and a few red blood cells. The specific gravity was between 1.013 and 1.015.

At this time the diseases that had to be considered in making a diagnosis were malaria, miliary tuberculosis, typhoid fever, and infectious endocarditis. Malaria was excluded because of the unremitting elevation of temperature, the negative blood examination, polynucleosis, and the failure of response to quinin. Miliary tuberculosis was ruled out because of the negative history and negative lung findings (including roentgen-ray), the slow pulse, and absence of lymphocytosis. Typhoid fever was excluded because of the repeated chills, absence of rash, negative Widal reaction, and polynucleosis. A probable diagnosis of infectious endocarditis was, therefore, made, although we could not explain the absence of clinical evidence of endocarditis (murmurs, etc.), and the absence of petechiae and sternal tenderness; but the chills and fever, the peculiar skin pallor, the splenic tumor, the polynucleosis, and the microscopic blood in the urine could best be explained on a basis of subacute endocarditis; but we did not suspect the influenza bacillus as the causative agent.

Subsequent Clinical Course.—The patient became more toxic in the ensuing days. He developed a suspicious Kernig's sign, and Babinski phenomenon, and some tenderness over the spleen and liver. The blood count revealed now 22,400 leukocytes, with 86 per cent. polymorphonuclears. A spinal tap revealed a normal cerebrospinal fluid. An agglutination test was negative for typhoid and paratyphoid. A blood culture was negative, and a blood chemistry examination gave normal figures.

About two weeks after his admission to the hospital, the patient developed petechiae in the conjunctiva, followed by petechiae in the skin. A blood culture about this time was positive for influenza bacilli, showing about 6 organisms per cubic centimeter of blood. Another blood culture several days later showed again influenza bacilli with 40 organisms per cubic centimeter of blood (progressive septicemia), and blood in the urine was found in increasing amounts.

The temperature continued high and was very irregular. The patient became more toxic and delirious toward the end. August 8, ten days prior to death, there was an indefinite systolic murmur at the apex, which the clinical notes record as a roughened first sound. August 14, there was a suggestion of a presystolic murmur, as well as a systolic murmur at the apex. The delirium and toxemia continued; the patient died of exhaustion, August 18, the thirty-sixth day of his illness.

Necropsy.—There was a peculiar pallor, and there were petechiae all over the body, especially the extremities and shoulders. Some of these petechiae were pale and somewhat depressed in the center. There were also petechiae in the conjunctiva and the mouth, and the mucous membranes were extremely pale. No petechiae were noted on the viscera except over the kidney and spleen, which showed a small number of infarcts.

The pericardium contained about 250 c.c. of clear fluid.

The heart was of about normal size, but pale. There was some hypertrophy of the left ventricular wall. The right ventricular wall was thinned out, and showed some fatty infiltration. The tricuspid and pulmonary valves were normal. The aortic valve, right cusp, was moderately thickened, and presented besides a fine, firm vegetation, which looked like a mere roughening of the endocardium at the edges of this vegetation. This was thought to be a beginning involvement of the valve.

The mitral valves were distorted by large, irregular, firm, varicose vegetations. These were pale and well organized (chronic valvular endocarditis), and superimposed on them were several small reddish-brown, friable, flat vegetations, which were ulcerated, and which extended to the base of the valve, and on to the auricular wall on the left cusp, and on the chordae tendineae of the right cusp. Some of these chordae tendineae were surrounded by these firm, friable vegetations in a cufflike manner. Within the left ventricle there was a small thrombus, moderately pale and partially organized, but not adherent to the ventricular wall.

The spleen was enlarged from four to five times its normal size. There were several small, reddish and reddish-gray infarcts scattered over its surface, as well as over the cut section. These measured about 2 to 3 mm. In addition to these smaller infarcts there were several larger ones, irregular in outline, measuring about 1 to 1.5 cm. in size, pale gray, and rather firm, which were considered older and partially organized infarcts. The capsule of the spleen was moderately thickened. Microscopic examination disclosed moderate, generalized congestion, and partial replacement of the malphighian bodies by inflammatory tissue.

The kidneys contained small infarcts similar to those of the spleen. The markings were indistinct, the capsule stripped with ease, and the parenchyma was swollen (cloudy swelling). Microscopic examination revealed an increase of connective tissue about the tubules and glomeruli. The tubular epithelium showed cloudy swelling, and some glomeruli hyaline replacement, varying in extent from just a portion of the glomeruli to complete hyaline degeneration.

Postmortem cultures were negative.

COMMENT

There are several points that one would like to clear up in connection with this case. As to the portal of entry, we found no primary lesion unless we assume that the nasopharyngitis described by the patient as a "cold in the head," with a possible latent sinusitis, was responsible for his subsequent illness. It is well known, however, that sinus infections are the rule rather than the exception in influenza. Brooks,[3] with his extensive experience with influenza in the army, said: "My own studies of 9,000 fatal cases of pandemic influenza have fully convinced me that sinus and nasal infection is an essential part of the introduction of the disease, and, in my opinion, it remains as the focus of infection and reinfection, from which subsequently develops most of the complications and sequelae of the disease," and yet influenzal septicemia, especially associated with ulcerative valvular lesions, were by no means frequently encountered during the recent epidemics. It is rather surprising how well patients with chronic valvular endocarditis get along during the prevalence of influenza. One is almost tempted to assume that the influenza bacillus plays only a minor and secondary rôle in so-called epidemic influenza. Otherwise, we should have had more cases of subacute bacterial endocarditis due to this organism.

1018 East One Hundred and Sixty-Third Street—1220 Grand Concourse.

A COMPARISON OF SEVERAL CLINICAL QUANTITATIVE BLOOD SUGAR METHODS *

WILLIAM THALHIMER, M.D.
AND
HELEN UPDEGRAFF, A.B., M.A.
MILWAUKEE

This investigation is a comparison of four quantitative, clinical methods for determining blood sugar. These are the original method of Lewis and Benedict,[1] the Myers and Bailey [2] and Benedict [3] modifications of this, and the latest modification of the method of Folin and Wu.[4] The Lewis-Benedict method was used in only a few determinations, the investigation being confined mainly to the three other methods.

It is well known that the results with the copper methods are consistently lower than those with the

3. Brooks, Harlow: M. Clin. N. Am. **4**: 29 (July) 1920.

* From the Laboratories of Columbia Hospital.

* Because of lack of space, this article is abbreviated in THE JOURNAL by the omission of a discussion of the literature. The complete article appears in the authors' reprints.

1. Lewis, R. C., and Benedict, S. R.: J. Biol. Chem. **20**: 61, 1915.
2. Myers, V. C., and Bailey, C. V.: J. Biol. Chem. **24**: 141 (Feb.) 1916.
3. Benedict, S. R.: J. Biol. Chem. **34**: 203 (April) 1918.
4. Folin, O., and Wu, H.: J. Biol. Chem. **41**: 367 (March) 1920.

picric acid methods.[5] If, with both types of methods, it is possible to estimate accurately changes in concentration of blood sugar, then it is only necessary to obtain normal figures for each method, and judge the abnormal figures accordingly. The usual figures[5] found reported for blood sugar in normal persons, are, in blood obtained before breakfast, from 0.07 to 0.12 per cent., with an occasional high normal of 0.14 or even 0.16 per cent.

When the blood sugar increases, or when glucose is added to blood (in vitro), if all of these methods are accurate, the increase determined by all methods should be proportional. In the instance in which sugar is added to the blood, the figures for the added glucose should approach the theoretical.

It may be stated that in our hands not only has the Benedict modification always given the highest figures, but when glucose was added to the blood the proportionate increase in the figures by the Benedict modification was greater than by the other methods. The Benedict modification also showed a greater percentage variation in a case of diabetes mellitus with high blood sugar determined on three different days. The figures obtained with Myers and Bailey's modification were lower than those obtained with the Benedict modification, and higher than the figures obtained with the latest modification of the method of Folin and Wu. The few figures obtained with the original Lewis-Benedict method were at about the same level as the Folin and Wu figures. Determinations of blood sugar in the series of normals studied by the three methods mentioned showed, however, approximately the same degree of variation by each method.

The picric acid methods have been widely used and have given valuable information to clinicians, and our study does not detract from their proved value. It does show, we believe, that one must be somewhat more circumspect in interpreting results obtained with picric methods than is, perhaps, generally recognized.

METHODS

In this investigation, four blood sugar methods were used: Benedict's[3] modification of the method of Lewis and Benedict; Myers and Bailey's[2] modification of the method of Lewis and Benedict; the latest modification of the method of Folin and Wu,[4] and, in two of the experiments on the recovery of added glucose from beef blood, the original method of Lewis and Benedict.[1]

All four are colorimtric methods. The basis of the original method of Lewis and Benedict and the two modifications of this method is the red to brown color of the reduction product (probably sodium picramate) formed by the interaction of the glucose in the blood filtrate and sodium picrate. This reaction is made to take place in the presence of a moderate excess of sodium carbonate when heated almost to dryness over a free flame, in the case of the original method of Lewis and Benedict, and at the temperature of boiling water for fifteen minutes,[14] in the case of the other two methods. In these three methods the protein of the blood is removed by precipitation with the picric acid which is used for the development of the color. The picric acid is thus made to serve the dual rôle of a precipitating and a colorimetric reagent. In the Myers and Bailey modification, the blood is laked with four volumes of water and then saturated with dry picric acid, stirred until the protein is completely precipitated, centrifuged and filtered. In the Benedict modification, the blood is laked with 2 volumes of water; 9½ volumes of a saturated solution of picric acid in 0.5 per cent. sodium hydroxid are added, and the mixture is shaken vigorously until the protein is completely precipitated and then filtered. The picrate reagent of the Benedict modification contains about three times[15] as much picric acid as a saturated aqueous solution. The original method of Lewis and Benedict differs from the two other picric acid methods in that less acid is used to precipitate the blood protein (15 c.c. of a saturated aqueous solution of picric acid to 2 c.c. of blood laked with 8 c.c. of water), and the filtrate is heated almost to dryness with the carbonate over a free flame instead of in a boiling water bath.

The basis of the method of Folin and Wu is the deep blue color formed by the reaction of a molybdate phosphate solution with the cuprous oxid reduced from cupric sulphate by the glucose in the unknown solution or blood filtrate. In this method the blood is laked with 7 volumes of water and the protein precipitated by vigorous shaking after the addition of 1 volume of 10 per cent. sodium tungstate and 1 volume of two-thirds normal sulphuric acid. After complete precipitation of the blood protein, the mixture is filtered.

TECHNIC

For the details of technic, reference should be made to the original articles. It is sufficient to state here that the details of technic in each method as outlined in the original articles were rigidly adhered to throughout this work.

In most cases the filtrates from the blood and spinal fluid were examined immediately, and in no case was a filtrate allowed to stand more than one, or, at the most, two hours. Duplicates were run on all filtrates. In each determination, the average of from three to five colorimetric readings was taken.

In the sugar determinations on spinal fluid, exactly the same technic was employed as is employed for blood in the case of the Myers and Bailey modification of the method of Lewis and Benedict and in the case of the method of Folin and Wu. In the latter method a glucose standard containing only 0.5 mg.[16] of glucose per 10 c.c. was used in addition to the two used for blood, which contain, respectively, 1 and 2 mg., of glucose per 10 c.c. As the protein content of spinal fluid is much less than that of blood, it would seem that considerably less sodium tungstate and sulphuric acid than is used by Folin and Wu for precipitation of blood protein would suffice for complete precipitation of the protein in spinal fluid. Experiments in which half the usual amounts of the foregoing precipitants were employed yielded results identical with the results obtained with the full amounts of the precipitants. For the sake of uniformity, the amounts of the two precipitants specified by Folin and Wu were employed in all the determinations by the Folin-Wu method which are here reported.

In the application of the Benedict modification to spinal fluid, Professor Benedict suggested to us, shortly after this investigation was started, that it would be better to dilute the spinal fluid with 5 instead of 2 vol-

5. Williams, J. R., and Humphreys, E. M.: The Clinical Significance of Blood Sugar in Diabetes Mellitus, Arch. Int. Med. **23**: 537 (May) 1919.

14. Myers and Bailey specified heating for fifteen minutes. Benedict, in his original communication, specifies only ten minutes of heating, but in a communication to Falk (Falk, K. G., and Noyes, H. M.: J. Biol. Chem. **42**: 109 [May] 1920) recommends a longer period.

15. Benedict, S. R., and Osterberg, E.: J. Biol. Chem. **34**: 195 (April) 1918.

16. Foster, H. E.: Hyperglycorachia in Epidemic Encephalitis, J. A. M. A. **76**: 1300 (May 7) 1921.

umes of water, and to add 6½ volumes of picrate instead of 9½, in order to reduce the amount of picric acid radical in the filtrate. The reason for this is quite apparent. The protein content of spinal fluid is much less than that of blood. For this reason very little picrate is removed with the precipitate on precipitation of the protein and, consequently, if the original technic is followed, the filtrate will contain more picrate and hence give a deeper color than the glucose standard which the permanent picramic standard is made to match. We have specified in the tables which technic was used for spinal fluid sugar as either "original or changed."

The blood was collected in corked test tubes, marked at the level to which they were to be filled. A 2 per cent. solution of potassium oxalate was kept on hand, and enough of this was added to each tube to furnish 20 mg. of oxalate per 10 c.c. of blood. Thus, if the tube was marked at the 5 c.c. level, 0.5 c.c. of 2 per cent. potassium oxalate was added, and the solution evaporated to dryness so as to form a thin film of oxalate over the inner surface of the test tube. The blood was drawn with a syringe, before breakfast unless otherwise stated. Whenever sugar determinations were made on the blood and spinal fluid of the same patient, the spinal fluid was drawn at the same time as the blood.

In the experiments in which pure glucose was added to beef blood and sheep blood, the requisite amount of glucose was accurately weighed and transferred carefully to a 100 c.c. volumetric flask. The flask was then filled to the mark with blood, and the contents thoroughly mixed.

APPARATUS

A Bock-Benedict colorimeter was used throughout. Daylight, preferably the light reflected from a white cloud, was utilized whenever available. On dark days an artificial light was used, the source of which was a 75 watt electric bulb enclosed in a white enameled box. In case artificial light was used, this fact is noted. Throughout all the readings the standard was set uniformly at 15 mm.

All measuring apparatus, including the Oswald pipets used for measuring the blood, was checked and calibrated in this laboratory.

REAGENTS

The picric acid used was J. T. Baker's analyzed, which was purified by the method of Folin and Doisy.[17] When 8 c.c. of the picrate-picric acid reagent prepared from this was heated with 1 c.c. of 20 per cent. sodium carbonate in a boiling water bath for fifteen minutes, there was no marked increased color development. This reagent was likewise checked against that of Professor Farmer of Northwestern University School of Medicine, and was found to be identical with his.

The picramic acid, which was prepared by the method of Egerer,[18] was furnished us by Dr. J. C. Bock. The picric acid and picramic acid reagents were kept at all times in brown bottles in a dark closet, and never exposed to light except when in use.

The pure glucose used throughout these experiments was likewise furnished us by Dr. Bock. It had been purified by the acetic acid method of Hudson,[19] dried in the thermostat at 37 C., kept in a desiccator over calcium chlorid, and gave the theoretical polariscopic readings. Our reagents were repeatedly checked against this pure glucose.

COMMENT

A number (twenty-four) of the samples of normal bloods were analyzed by the Benedict modification of the Lewis-Benedict method (during March and April).

The samples were obtained from physicians, nurses and patients, care being taken to choose persons without any metabolic abnormalities. The results obtained are rather striking because they are, with only one exception of 0.098 per cent., above 0.12 per cent., the generally accepted upper limit of normal blood sugar. The lowest figures (excepting 0.098 per cent.) is 0.126 per cent.; the maximum is 0.171 per cent. The average of the twenty-four results is 0.141 per cent. There is one result below 0.12 per cent.; there are four above 0.12 per cent., eight above 0.13 per cent., four above 0.14 per cent., and seven above 0.15 per cent.[20]

TABLE 3.—SUGAR IN THE BLOOD OF NORMAL PERSONS AND HOSPITAL PATIENTS HAVING NO APPARENT ABNORMALITY OF METABOLISM: COMPARATIVE RESULTS BY THREE METHODS

			Per Cent. Blood Sugar		
Date	Subject	Sex*	Benedict	Myers and Bailey	Folin and Wu
3/23/21	P. K.	♂	0.150	.....	.....
3/23/21	T. R.	♂	0.146	.....	.....
7/14/21	P. K.	♂	0.184	0.167	.....
7/14/21	T. R.	♂	0.129	0.125	.....
8/ 2/21	G. N. E.	♂	0.107	0.107	0.075
8/ 3/21	G. N.	♂	0.134	0.120	0.098
8/ 8/21	R. O.	♂	0.115	0.098	0.100
8/ 8/21	R. L.	♀	0.125	0.114	0.100
8/ 8/21	S. T.	♀	0.121	0.110	0.100
8/ 8/21	S. Z. R.	♀	0.136	0.115	0.100
8/ 8/21	Z. K.	♀	0.125	0.115	0.107
8/ 9/21	D. L.	♀	0.136	0.120	0.115
8/ 9/21	H. Z.	♀	0.115	0.107	0.097
8/ 9/21	R. T. S.	♂	0.115	0.103	0.097
8/ 9/21	S. E.	♀	0.125	0.115	0.097
8/ 9/21	S. R.	♀	0.125	0.123	0.103
8/10/21	E. N.	♂	0.136	0.115	0.094
8/10/21	H. H.	♂	0.128	0.125	0.092
8/10/21	P. K.	♂	0.136	0.130	0.095
8/10/21	R. R. S.	♂	0.125	0.111	0.092
8/10/21	T. R.	♂	0.132	0.118	0.092
8/11/21	G. K.	♂	0.115	0.094	0.079
8/11/21	K. N.	♂	0.117	0.100	0.080
	Sugar in Blood of Cases of Diabetes Mellitus and Furunculosis				
7/25/21	M. N.	♂	0.200	0.177	.....
8/ 3/21	M. N.	♂	0.200	0.183	0.154
8/13/21	O. E.	♀	0.316	0.273	0.261
8/15/21	O. E.	♀	0.263	0.234	0.219
8/29/21	O. E.	♀	0.169	0.158	0.143
8/13/21	E. N.	♀	0.144	0.126	0.107
8/ 6/21	E. R.	♂	0.122	0.107	0.088

* In this column, ♂ indicates male, and ♀ female.

These figures, obtained in apparently normal persons, first called our attention to the high results obtained with the Benedict modification of the Lewis-Benedict method. The investigation which followed can be divided into two parts. One part consists of blood sugar estimations in another group of normals (Table 3) by Myers and Bailey's and Folin and Wu's methods, as well as by the Benedict modification. The other part (Table 4) is a test of the accuracy of the three methods, and also of the original Lewis-Benedict method, in the recovery of glucose added to beef and sheep blood.

Table 3 also shows high figures by the Benedict modification, lower, however, than those quoted above. Slightly lower figures were obtained by Myers and Bailey's modification, and even lower ones by Folin and Wu's method.

17. Folin, O., and Doisy, E. A.: J. Biol. Chem. **28**: 349 (Jan.) 1917.
18. Egerer, G.: J. Biol. Chem. **35**: 565 (Sept.) 1918.
19. Hudson, C. S.: J. Am. Chem. Soc. **39**: 322, 1917.

20. It is unfortunate that at the time these results were obtained we had not yet decided to make a comparison of the several blood sugar methods.

This same gradation holds true in Table 4, in which results obtained with four methods are presented. It may be noted also that a percentage of glucose considerably more than the added amount was recovered by Benedict's modification, while results definitely closer to the theoretical were obtained with the other methods. In this series of tests (Table 4) it will be noticed that, in general, the greater the amount of glucose present, the greater the excess over theoretical are the figures obtained by the Benedict modification.

A somewhat analogous result is found in the lower portion of Table 3, which shows figures from the blood of patients with diabetes and with furunculosis. In the case of Patient O. E., the percentage differences in the blood sugar figures, obtained on three different days, is greater by the Benedict modification than by the other two methods. This corresponds to the greater variation from the theoretical by the Benedict modification in the in vitro experiments when the amount of glucose added to blood is increased.

low protein content of spinal fluids), Myers and Bailey's modification, and the method of Folin and Wu are practically the same. The results with the (unchanged) blood sugar technic of Benedict's modification are slightly higher. As pointed out in describing the technic, the concentration of picric acid radical in the spinal fluid filtrates is higher when the original blood sugar technic is employed. There is not the degree of difference by the three methods when sugar is determined in spinal fluid that there is when it is determined in blood.

It can be seen that the high blood sugar figures with Benedict's modification are in agreement with the results of Wesselow, Folin and Wu, and Shaffer. In addition to this, our determinations of amounts of glucose added to blood show recovery with the Benedict modification of more than the theoretical amount of added glucose. The question which presents itself is, What is the explanation of these differences?

We have not attempted a critical examination of this.

TABLE 4.—A SERIES OF EXPERIMENTS DEALING WITH THE RECOVERY OF ADDED GLUCOSE FROM BEEF BLOOD AND SHEEP BLOOD BY FOUR DIFFERENT METHODS

					Blood				
					Blood Alone.	Blood + 100 Mg. Glucose per 100 C.c.		Blood + 200 Mg. Glucose per 100 C.c.	
Series Number	Date	Kind of Blood	Method	Standard	Per Cent. Sugar	Per Cent. Sugar	Per Cent. Added Glucose Recovered	Per Cent. Sugar	Per Cent. Added Glucose Recovered
1*	1/20/21	Beef	Benedict modification of Lewis and Benedict	Pieramic acid	0.118	0.242	124	0.380	131
2	4/21/21	Beef	Benedict modification of Lewis and Benedict	Pieramic acid	0.136	0.246	110	.....	.....
			Lewis and Benedict	Pure glucose	0.074	0.168	94	.....	.....
			Myers - Lewis modification of Lewis and Benedict	Pure glucose	0.109	0.211	102	.....	.....
3	5/17/21	Beef	Benedict modification of Lewis and Benedict	Pieramic acid	0.146	0.263	117	.....	.....
			Lewis and Benedict	Pure glucose	0.095	0.207	112	.....	.....
			Myers-Bailey modification of Lewis and Benedict	Pure glucose	0.114	0.222	108	.....	.....
4	8/ 4/21	Beef	Benedict modification of Lewis and Benedict	Pieramic acid	0.150	0.273	123	.....	.....
			Myers-Bailey modification of Lewis and Benedict	Pure glucose	0.136	0.242	106	.....	.....
			Folin and Wu	Pure glucose	0.115	0.214	99	.....	.....
5	8/ 5/21	Sheep	Benedict modification of Lewis and Benedict	Pieramic acid	0.083	0.200	117	.....	.....
			Myers-Bailey modification of Lewis and Benedict	Pure glucose	0.068	0.177	109	.....	.....
			Folin and Wu	Pure glucose	0.060	0.167	107	.....	.....

* Artificial light was used in Series 1.

In the accompanying chart, the results of a glucose tolerance test are recorded in which blood sugar determinations were made by the three methods. Curves are plotted for the results by each method. These results are consistently higher by the Benedict modification than by the Myers-Bailey modification, and the results by the Myers-Bailey modification are consistently higher than those by the method of Folin and Wu. The curves, however, remain nearly parallel and show almost the same difference when the blood sugar is high as when it is low.

The figures obtained for sugar in spinal fluid are given elsewhere. Difficulty in obtaining spinal fluid from control cases has rendered it possible to examine only a limited number. At first the only method used was the Benedict [3] modification for blood sugar. This was later changed, as indicated above in the description of the technic. As the study progressed, the other methods were introduced. There are, therefore, only a few spinal fluids which have been examined by all three methods. In these the results by the Benedict modification (changed to adapt it to correspond to the

The possibility that creatinin is the factor can quite certainly be eliminated, except in cases with marked nitrogen retention. It might be that there is an interfering substance (or substances) in blood, which is not creatinin, as has been suggested by other investigators. If this is the explanation, then the interfering substances are evidently present in much smaller amounts in spinal fluid. There is one aspect of the three picric acid methods, however, to which it seems worth while to call attention.

The blood filtrate in the Myers and Bailey modification contains less of the picric acid radical than the blood filtrate in the Benedict modification. Also, the blood filtrate in the original method of Lewis and Benedict contains a lesser concentration of picric acid radical than the blood filtrate in the Myers and Bailey modification.

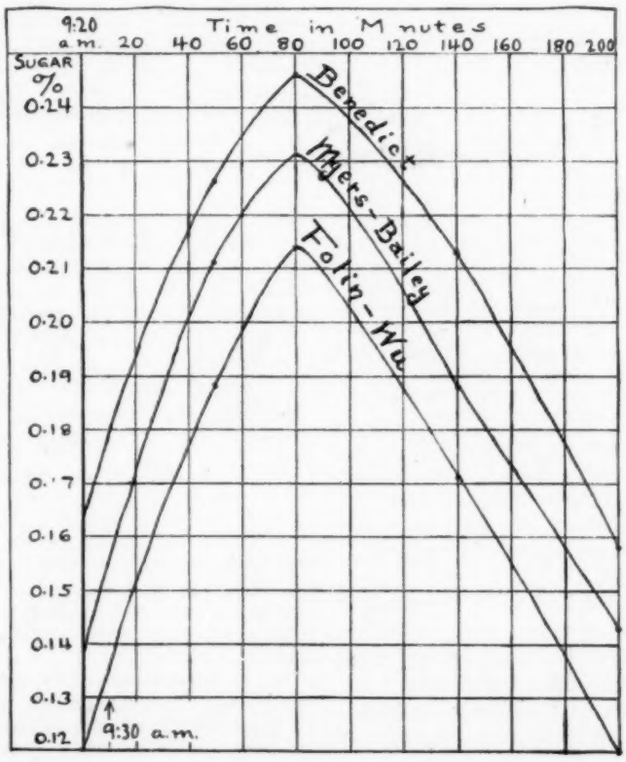
We have found the blood sugar figures by the Benedict modification at a distinctly higher level than those by the Myers and Bailey modification, and the latter at a higher level than the figures obtained by the original method of Lewis and Benedict. In other

words, as the concentration of picric acid radical is increased in a blood filtrate, it appears that higher figures for blood sugar are obtained. Such a finding might be explained by the assumption that an increase of picric acid radical increases the sensitiveness of the picric acid reagent for substances in the blood other than glucose. Two investigators [21] have expressed the opinion that the picrate reagent used in the Benedict modification is more sensitive to interfering blood constituents than an ordinary saturated aqueous solution of picric acid. Myers [22] attributes the increased sensitiveness of this reagent to the presence of sodium hydroxid. Our results would seem to indicate that the concentration of the picric acid radical also may be an influential factor in determining the sensitiveness of such a reagent for unknown blood constituents.

One other factor which possibly deserves consideration has been brought out by Falk and Noyes.[23] They have shown that with the combination of two colors, such as from picric acid and picramate, comparison in a colorimeter with a uniform color standard, such as the picramic acid standard of the Benedict modification, will not always give an accurate estimation of the amount of picramate present in the unknown solution. The results will vary with the concentration of the two colors in the unknown solution. No attempt was made in their investigation to show the limits of accuracy of determinations of varying amounts of glucose.

It can be stated that from the results reported in this article, and also by Wesselow, Folin and Wu, Myers, and Shaffer, the Benedict modification gives blood sugar figures considerably higher than do the other methods used. These figures for normal bloods are higher than those generally accepted. A separate standard of normal by the Benedict modification must be established when this method is used clinically. This, we believe, necessarily follows, so far as all blood sugar methods are concerned, as is indicated by many investigators using a still larger number of methods. There is at present no method which has been proved to determine the absolute amount of glucose in the blood. The blood is so complex and variable a mixture that it seems probable that an absolute blood sugar method will never be devised. On the other hand, it is remarkable that these methods have been brought to the present degree of accuracy. With any of the methods here studied, and with a number of others, quite an accurate knowledge can be obtained as to whether blood contains glucose in amounts which are normal, or above or below normal. The relative findings, day by day, when the blood sugar varies, can be even more accurately followed.

The usual test for accuracy of a blood sugar method is to determine how accurately it will estimate an amount of glucose added to blood. The Benedict modification, by giving results which are too high, does not meet this test as satisfactorily as other methods. This may not be considered a fair test, as the variation in the Benedict results, with human blood, keeps pace quite proportionally to that with other methods, with a possible exception in the case of high blood sugar findings in diabetes mellitus. We have not investigated the blood of nephritic patients from this standpoint.



Glucose tolerance test in a patient, aged 47, with comparative figures by three methods. At 9: 30 a. m., 100 gm. of glucose was administered by the mouth.

Whatever method of blood sugar determination is employed in a clinical laboratory, the original technic should be followed accurately in every detail whenever possible. There should be absolutely no variation from this; but, should one be necessary, it should be carefully described when figures for blood sugar are reported.

SUMMARY

Comparative blood sugar determinations were made by three different methods, the Myers and Bailey and the Benedict modifications of the method of Lewis and Benedict, and the latest modification of the method of Folin and Wu. The results obtained show that the blood sugar percentages as determined by the Benedict modification are, as a rule, at a higher level than those determined by the Myers and Bailey modification, and the latter higher than those by the method of Folin and Wu. The range of variation, however, in the figures obtained by each method is practically the same. A series of twenty-four normal persons examined during cold weather in March and April,[24] by the Benedict modification alone, yielded blood sugar figures ranging, with one exception, from 0.126 to 0.171 per cent. The lowest of these figures is higher than the generally accepted upper limit of normal by other methods, namely, 0.120 per cent. The exception referred to is 0.098 per cent. In a series of nineteen normal persons examined in the hot weather of July and August, the figures by the Benedict modification range from 0.107

21. Wesselow (Footnote 7). Myers (Footnote 22).
22. Myers, V. C.: Practical Chemical Analysis of Blood, St. Louis, C. V. Mosby Company, 1921, p. 66.
23. Falk, K. G., and Noyes, H. M.: J. Biol. Chem. **42**: 109 (May) 1920.

24. Some of our blood sugar findings are in agreement with some observations of Strouse (Arch. Int. Med. **26**: 751 [751] 1920) as to the possible relationship of weather conditions to the percentage amount of blood sugar. The figures obtained from normals in cold weather are slightly higher than those of Table 3, obtained from a similar group of persons in hot weather. This holds true, in particular, in two (P. K. and T. R.), whose blood sugars were first determined during cold weather in March and April, and later, in July and August, when the weather was very hot and oppressive.

to 0.136 per cent., by the Myers and Bailey modification from 0.094 to 0.130 per cent., and by the method of Folin and Wu from 0.075 to 0.115 per cent.

The results by four different methods of a series of five experiments on the recovery of glucose added to beef blood and sheep blood show that the Benedict modification yielded in each case a higher percentage recovery than the other three methods. The three other methods yielded percentages of recovery quite comparable to one another and closer to the theoretical than did the Benedict modification.

Blood sugar determinations were made on three succeeding days in a case of diabetes mellitus in which the patient was under treatment. The figures were obtained on each day by the three methods under investigation. On each succeeding day, each method showed a decided decrease in blood sugar percentage. However, the percentage differences between the figures obtained on the three successive days were greater by the Benedict modification than by the other two methods.

In a glucose tolerance test in a case of arthritis deformans, blood sugar determinations were made by the same three methods. Here the percentage differences in the figures obtained at different intervals by each method were in quite close agreement. The figures by the Benedict modification were at a distinctly higher level than those obtained by the Myers and Bailey modification, and the latter at a distinctly higher level than those obtained by the method of Folin and Wu; but the curves run very nearly parallel.

CONCLUSIONS

In interpreting the blood sugar findings obtained in any laboratory, it is of the utmost importance to the clinician that he be advised of the method employed in the laboratory in question and also of the range of normal figures for the method as actually determined in this laboratory.

The choice of a blood sugar method may be considered a matter of individual preference, provided the foregoing precautions are taken in interpreting the figures obtained. However, we believe that there is some evidence to indicate that, in some bloods containing a high percentage of sugar, the Benedict modification of the method of Lewis and Benedict does not yield results as reliable as the other methods discussed in this article. The Benedict and the Myers and Bailey modifications of the method of Lewis and Benedict, as well as the latest modification of the method of Folin and Wu, have impressed us as being on practically an equal footing as regards simplicity of technic.

Nature of Public Health Service.—The true province of the public health service is the prevention of disease. The efficiency of public health work is to be measured by the results of its work in the protection of the drinking water at its source, in the establishment and enforcement of regulations for the prevention of the spread of communicable disease, in the standardization and enforcement of regulations which will prevent the contamination of milk and other foods, in the establishment and enforcement of regulations which will insure comfortable and sanitary homes, workshops and places of recreation and amusement, in the establishment and enforcement of regulations to insure freedom from infection and injury in railroad and vehicular transportation, in the establishment and enforcement of regulations which will insure the inspection, the treatment for local infection and the physical education of schoolchildren.—F. Billings, *Hospital Social Service* **5**:217 (April) 1922.

Clinical Notes, Suggestions, and New Instruments

SPHENOID SAFETY BURR

JOHN A. CAVANAUGH, M.D., CHICAGO

The burr with handle, as it appears in the illustration, is 6 inches long and will fit on any electrically driven dental handle. The shaft passes through the hollow handle and through the burr, which rests within the dilated or hooded end of the handle. This shaft is held in position by a small screw. There is a small ridge on the proximal end of the handle, reverse to the burr, so that when the instrument is inserted into the nose the operator will know the position of the cutting surface of the burr.

The anterior wall of the sphenoid at the opening of the ostium is removed in the usual way, an opening being made large enough to introduce the hooded burr with the cutting edge downward. The lower part of this wall can be destroyed

Sphenoid safety burr.

with ease and without danger. After this wall has been removed to the floor of the cavity, the soft overhanging tissue can be cut away with biting forceps. Since using this instrument I have found that the opening into this cavity does not granulate in, as it does by other methods.

7 West Madison Street.

CHLORINATED LIME AND CYSTS OF HUMAN INTESTINAL PARASITES *

NATHANIEL BERCOVITZ, M.D., BERKELEY, CALIF.
Fellow of China Medical Board, Rockefeller Foundation

In the course of an investigation of the viability of ova and cysts of human intestinal parasites now being made under the direction of Dr. C. A. Kofoid, under a grant of the Research Board of the University of California, the effect of chlorinated lime on cysts of amebas and flagellates has been studied.

For a number of years chlorinated lime has been used extensively for purposes of sterilization of drinking water. In 1916, Mills of Korea advocated the general use, by foreigners in the Far East, of chlorinated lime tablets, with a small quantity of magnesium carbonate as an excipient added for sterilizing drinking water. At that time I was in Kachek, Hainan, China, and experimented with these tablets, but found that they deteriorated so rapidly in the hot and humid climate there as to be of no value. I tried another brand of chlorinated lime tablets with similar results, and, in correspondence, the manufacturers said that chlorinated lime could not be used for sterilizing purposes in tropical climates.

A manufacturer supplied me with chlorinated lime in glass ampules, 1 grain of chlorinated lime dissolved in distilled water, to the ampule. These were made in September, 1919, and kept in the tropics until June, 1921, and at present in California they still retain their full strength. This is a good way to put up chlorinated lime, and great hopes were entertained that there might be a general application of this method of sterilizing drinking water and fresh fruits and vegetables in the tropics and other places where such diseases as cholera, typhoid fever and dysentery are endemic.

In the present research the effect of chlorinated lime on cysts of amebas and flagellates was noted. The types studied were: *Endolimax nana*, small race; *Endameba dysenteriae*, large and small races; *Endameba coli; Councilmania lafleuri*, Kofoid and Swezy; *Giardia intestinalis*, and *Chilomastix mesnili*. The viability of the cyst was tested by using an aqueous

* From the Zoological Laboratory, University of California.

solution of eosin. This has been adopted elsewhere as a standard method,[1] the cysts which stain being considered as dead, and those not staining showing clear in the pink background, being regarded as alive.

All cysts of the types named were unaffected by the chlorinated lime. In each case the presence of free chlorin was demonstrated by the potassium iodid-starch method. Various concentrations were used from 0.01 to 1 per cent., but in each case the result was the same.

In 1917, Wenyon and O'Connor[2] used chlorinated lime tablets on cysts of *Endameba dysenteriae* (*histolytica*) and found that they were not affected; they also "found that free chlorin in water at a strength of 1:10,000 failed to kill the cysts after several hours' exposure."

It is evident that the use of chlorinated lime has its limitations, and this communication is made in order to warn against a false sense of security when chlorinated lime is used. This fact is important in view of the increasing number of amebic and flagellate infections being found in America today. There is no doubt that free amebas and flagellates are killed by minute doses, but the fact that cysts of amebas and flagellates are not killed even by strong doses minimizes its value. Recent communications from other sources[3] indicate, furthermore, that the chlorination process as ordinarily used is not effective against certain types of encapsulated bacteria.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION. W. A. PUCKNER, SECRETARY.

SABROMIN. — Calbroben. — Calcium Dibrombehenate $Ca(C_{21}H_{41}Br_2COO)_2$.

Sabromin contains not less than 28.5 per cent. of bromine.

Actions and Uses.—Sabromin is converted in the stomach into dibrombehenic acid, and this is absorbed from the intestinal tract. The absorption and elimination are slower than that of the inorganic bromides; hence, sabromin is not adapted to conditions in which a rapid saturation of the system with bromine is required. It is indicated in conditions in which the bromides cannot be administered for continued periods without gastric disturbance or in which brominism is caused readily. It is claimed that sabromin is of value in conditions in which a mild sedative action is desired, particularly in conditions requiring prolonged administration, and that because of absence of taste, it is of value in pediatric practice.

Dosage.—For adults, from 0.3 to 1.2 Gm. (5 to 20 grains). When administered in the form of tablets, these should be masticated before swallowing.

Manufactured by the Bayer Company, Inc., Rensselaer, N. Y. (Winthrop Chemical Company, Inc., New York, distributor). U. S. patent 848,230 (March 26, 1907; expires 1924). U. S. trademark 74,091.

Sabromin tablets, 8 grains.

Sabromin is a yellowish white powder; odorless and tasteless. It is insoluble in water and alcohol, but soluble in ether, chloroform, acetone, benzene, petroleum benzin and carbon tetrachloride.

Shake about 0.5 Gm. of sabromin with 10 Cc. of boiling water and filter. The filtrate is neutral to litmus paper and gives not more than a slight opalescence with silver nitrate solution (*soluble bromides*), and no precipitate with barium chloride solution (*sulphates*).

Heat about 0.2 Gm. of sabromin with 5 Cc. of sodium hydroxide solution for one minute. Dilute the solution with 5 Cc. of water, acidulate with acetic acid, filter, and divide the filtrate into two portions. To one portion add ammonium oxalate solution. A white precipitate results (*calcium*); shake the second portion with 5 Cc. of dilute hydrochloric acid; add 10 drops of chlorine water and 5 Cc. of chloroform and agitate the mixture. After separation, the chloroform shows a yellow coloration (*bromine*).

Dry about 1 Gm. of sabromin, accurately weighed to constant weight at 100 C. The loss is not more than 2.5 per cent. (*limit of moisture*).

Dissolve 0.25 Gm. of sabromin in 5 Cc. of chloroform and add 3 drops of absolute alcohol. Not more than a slight opalescence is produced, and only a very slight precipitate occurs after standing for twenty-four hours.

Boil about 2 Gm. of sabromin, accurately weighed, in a reflux apparatus with 100 Cc. of 10 per cent. alcoholic potassium hydroxide for six hours. Transfer the solution to a porcelain evaporating dish and evaporate the alcohol over a water bath. Dilute the residue with a little water, pour the solution into a 500 Cc. flask, and add 40 Cc. of 30 per cent. nitric acid. Dilute to 500 Cc. with water, shake well and filter. To 250 Cc. of the filtrate add 20 Cc. of nitric acid and 50 Cc. of tenth-normal silver nitrate. Titrate the excess of silver salt with tenth-normal potassium sulphocyanate solution, using ferric ammonium sulphate as indicator. The tenth-normal silver nitrate consumed corresponds to not less than 28.5 per cent. of bromine.

Heat about 2 Gm. of dried sabromin, accurately weighed, until most of the carbon has been consumed; extract the residue with hot, diluted hydrochloric acid; filter; add a slight excess, each of ammonia water and ammonium oxalate solution; collect the precipitate, dry it and ignite it to calcium oxide in the usual way. The weight of calcium oxide corresponds to not less than 3.5 per cent. of calcium.

POWDERED PROTEIN MILK-MERRELL-SOULE.—Dry Protein Milk.—A modified milk preparation having a relatively high protein content and a relatively low carbohydrate content. Each 100 Gm. contains approximately protein, 38 Gm.; butter fat, 27 Gm.; free lactic acid, 3 Gm.; lactose, 24 Gm., and ash, 5 Gm.

Actions and Uses.—When suitably mixed with water, powdered protein milk is said to be useful for correcting intestinal disorders of infants and children. It is claimed that the preparation is especially satisfactory because of the flocculent nature of the casein.

Dosage.—For the majority of conditions, powdered protein milk should be administered in small quantities according to age and condition of the patient, after a period of starvation of from twelve to forty-eight hours. Suitable carbohydrates may gradually be added to the preparation as indicated by the clinical conditions.

To prepare protein milk for use, 1 ounce (3½ tablespoonfuls) of powdered protein milk is placed on the surface of 11 fluidounces of cold, previously boiled, water and the mixture beaten with an egg beater or wire whip. Greater dilutions are sometimes prescribed. Carbohydrates, if prescribed, are dissolved in a little warm water and added to the protein milk, and then sufficient boiled water is added to make 12 fluidounces. One hundred Cc. of the finished mixture, without additional carbohydrate, contains approximately 3.45 Gm. of protein, 2.45 Gm. of butter fat, 2.18 Gm. of lactose, and 0.45 Gm. of ash.

Manufactured by the Merrell-Soule Company, Syracuse, N. Y. No U. S. patent or trademark.

IZAL.—An albuminous emulsion containing not less than 50 per cent. of a liquid, "izal oil," which is obtained in the destructive distillation of bituminous coal, and which consists essentially of monatomic phenols boiling between 205 and 300 C. Izal is, therefore, practically free from phenol and cresols.

Actions and Uses.—Izal is a germicide and disinfectant. The germicidal efficiency of izal is claimed to be twelve times as great as that of an equal quantity of phenol, but it is stated to be less toxic than phenol.

Dosage.—For general use and as a gargle, douche, etc., dilutions of 1:300 (1 fluidrachm to 1 quart of water) are used. For the disinfection of urine, feces, etc., dilutions of 1:100 (1 fluidrachm to 1 pint of water) are advised. Izal is not intended for internal use.

Manufactured by The Abbott Laboratories, Chicago, under license from Newton, Chambers and Company, Ltd., Thorncliffe, near Sheffield, England. No U. S. patent. U. S. trademark.

Izal Disinfectant Powder: Izal oil, 10 per cent.; naphthalene, 5 per cent.; inert, absorbent earth, 85 per cent.

Izal oil is obtained by extraction and fractionation of substances which are obtained when certain grades of bituminous coal are distilled at controlled temperature. It is fractionated to exclude cresols.

Mix 100 Cc. of izal with an equal volume of hydrochloric acid, heat to 80 C. for thirty minutes, and pour the mixture into a measuring cylinder and allow to cool. The supernatant layer of izal oil should measure at least 50 Cc.

Into a standard Engler side tube flask measure 50 Cc. of izal oil as obtained in the preceding test and distil through a condenser at the rate of 60 drops per minute; the thermometer bulb should be opposite the side tube, and the readings should be corrected for temperature and pressure; at least 90 per cent. of the "oil" distils between 205 and 300 C.

When tested by the U. S. Hygienic Laboratory method, izal has a phenol coefficient of 12.

1. Kuenen, W. A., and Swellengrebel, N. H.: Die Entamoeba des Menschen und ihre praktische Bedeutung, Centralbl. f. Bakteriol, I, Orig. **71**: 378, 1913. Boeck, W. C.: Thermal Death Point of Protozoan Cysts, Am. J. Hyg. **1**: 365 (July) 1921.

2. Wenyon, C. M., and O'Connor, F. W.: Human Intestinal Protozoa in the Near East, Wellcome Burroughs Sc. Rev., 1917.

3. Larner, H. B.: Bacillus Welchii in a Public Water Supply as a Possible Cause of Intestinal Disease, J. A. M. A. **78**: 276 (Jan. 28) 1922.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, MAY 6, 1922

DETOXIFYING DEVICES IN THE LIVING BODY

The enormously rapid development of the new science of immunology in the last few years has tended to focus attention on a special group of factors contributing immunity and resistance to the body. In the literature of this recent progress one reads of antitoxins, cytolysins, agglutinins and precipitins, of phagocytins and defensive ferments, and of a growing number of novel conceptions scarcely realized a generation ago. In the early enthusiasm for any new aspect of science, the pendulum of consideration is always liable to swing too far in one direction or another before the usual stabilization takes place. Thus, amid the intense and well warranted interest in the latest principles of immunology, some of the long known protective devices of the organism have almost been forgotten. In truth, the body often avails itself of relatively simple chemical reactions, such as oxidation, reduction and synthesis, to avert the menace of a harmful substance. Presumably, many of the newer "immune reactions" are fundamentally chemical in character; but this is likely to be overlooked when they are described in a vocabulary that has an unfamiliar sound to the untutored chemist.

When mineral acids or bases are introduced into the body they are, if possible, neutralized and thereby prevented from producing further injury. To a large extent the marvelous neutrality regulation of the organism is a chemical device to avert the toxic effects of deleterious substances that may arise. There is no longer anything essentially vague about this, as there is about the less clearly understood toxins and antitoxins. Other detrimental substances, such as alcohols and some of the organic acids, are readily burned up in the tissues and thus excluded from doing further harm. The resistant benzoic acid is united with glycocoll and excreted as the harmless hippuric acid (benzoylglycocoll). A still different chemical protective is seen in the "conjugation" of certain toxic compounds into less objectional derivatives. Putrefaction in the alimentary tract, for example, gives rise to a diversity of bacterial decomposition products of proteins or their constituent amino-acids. Indol thus formed is hydroxylated and conjugated to form the indican of the urine. The hydroxyacids which have no toxic effects are not subjected in any noticeable degree to oxidation or conjugation, and are almost completely excreted in the urine in the free state.

Another group of such putrefactive products of biochemical importance includes the volatile phenols, notably paracresol and phenol. As these are toxic even in small amounts, the latter being familiar under the more popular name of carbolic acid, they are dealt with by the body in a different way. Baumann long ago demonstrated that phenols can be detoxified by combination with sulphuric acid (doubtless originating principally from oxidized protein-sulphur). In a renewed study of this phenomenon, Pelkan and Whipple [1] have come to the conclusion that more than half of these toxic phenols are oxidized by the intestinal mucosa, body fluids, and liver parenchyma. The remainder is conjugated in the liver with sulphuric or glycuronic acids. After passing from the liver, the conjugated phenols are uniformly distributed to all the tissues, and are rapidly eliminated by normal kidneys, probably within twelve hours.

In expressing their confidence that the synthesis of phenol-sulphuric and phenol-glycuronic acids takes place only in the hepatic parenchyma, Pelkan and Whipple lend a new importance to the liver as a protective organ. They state that the volatile phenols produced in the intestinal tract are probably to a large extent rapidly oxidized by the intestinal mucosa and the liver—and those which escape this process are completely conjugated by the liver. When the oxidizing mechanism is overwhelmed by large amounts of phenol, as occurs when phenol is ingested, more of that substance reaches the hepatic tissues unchanged, and the relative amount of conjugated phenols is greater. Ordinarily, they add, this oxidizing mechanism is sufficient, and much larger amounts of volatile phenols than are normally produced in the intestine are oxidized within a few minutes. This serves to strengthen the argument that free volatile phenols as such cannot remain in the blood stream for any considerable period.

As phenol conjugation seems to be a function of the liver cells exclusively, it is easy to understand why, as Pelkan and Whipple have further found, extensive liver injury due to poisons will always lessen phenol conjugation. Extreme and fatal liver injury (chloroform) will reduce phenol conjugation to zero. That slight injuries are not attended by such a failure of detoxication is due to the enormous factor of safety in the mass of liver tissue in the body. It is helpful to know that something more than mere vague hypothesis is represented by the familiar statement that the liver protects us against intestinal poisons.

1. Pelkan, K. F.: The Physiology of the Phenols, I, A Quantitative Method for the Determination of Phenols in the Blood, J. Biol. Chem. **50**: 491 (Feb.) 1922. Pelkan, K. F., and Whipple, G. H.: II, Absorption, Conjugation and Excretion, ibid., p. 499; Studies of Liver Function, III, Phenol Conjugation as Influenced by Liver Injury and Insufficiency, ibid., p. 513.

THE PHYSIOLOGIC AND THERAPEUTIC ACTION OF LIGHT

Since the day when our first ancestor crawled out of the primordial ooze to bask in the sun, ailing animal life has instinctively turned to the beneficent source of energy for comfort in its afflictions. Universal experience has demonstrated the benefits of heliotherapy in whatever primitive forms it has been applied, and probably it is the oldest of all forms of therapy. More exact modern methods have served to support the experience of the ancients, and the recent experimental study of rickets has furnished a most remarkable instance of the definite, if inexplicable, etiologic relation and therapeutic effect of light. As stated by Hess [1] in his review of this topic in THE JOURNAL two weeks ago, the experimental production of rickets by defective diets may be determined or prevented by sunlight or artificial light of sufficient intensity and proper quality, and human rickets may be improved or cured by the same agency. The frequency of rickets in negroes and the dark skinned white races occupying northern cities evidently depends partly on defective nutrition and partly on the shutting out of the sunlight by the pigment intended to protect them from excessive doses of light in their native habitats. Heliotherapy in tuberculosis has also taken a definite place in therapeutics, while the therapeutic effects of radiant energy in other forms is, of course, one of the most rapidly growing aspects of medicine, often leaping far ahead of any safe experimental foundation.

A thorough review of the subject of the physiologic action of light by Janet H. Clark [2] is, therefore, most timely. We learn that, despite the long history of heliotherapy, the first systematic effort to study the biologic effects of light, and its therapeutic uses, was made by Finsen, when he founded his light institute in Copenhagen in 1896. Much valuable work, both theoretical and practical, has been done there since, with especial success on the therapeutic side, in the treatment of lupus, but the fundamental problem of the mode of action of light on the living cell remains unsolved. Although there is a universal conviction that sunlight is healthful, it is certain that human beings and animals can live a long time in darkness without any noticeably bad results. Blessing, who acted as physician to Nansen during his expedition in the *Fram*, published a report showing that members of the party exhibited no evidence of anemia during the trip. More recently, Grober and Sempell examined horses that had worked for years in coal mines, and found no anemia in any case in which a satisfactory nutritive condition existed. But, though the physiologic effect of sunlight seems at first sight indefinite and of dubious importance, the action of far ultraviolet light on normal tissue, and the action of near ultraviolet and visible light under certain pathologic conditions, has been investigated enough to show that there are well-defined effects due to light, closely related to the physiologic results of exposure to radium and the roentgen rays.

Recent contributions have come chiefly through study of the biologic effects of light in relation to the wave length of the rays concerned. In general, the shorter the wave length the greater the physiologic effect. The spectrum of sunlight reaches only to 290 microns in the ultraviolet, and light greater than 300 microns being our normal environment, it is obvious that any organism ordinarily exposed to this light and easily injured by it would have perished long since. Light less than 300 microns is an unnatural environment, and produces in all living cells strong and often very harmful reactions. Since the effect of light is probably due to the photochemical reactions produced when light energy is absorbed, it is not surprising to find that the various constituents of protoplasm begin to absorb light strongly in the neighborhood of 300 microns. We find that bacteria begin to be killed quickly by wave lengths of 296 microns or below, and hence sunlight contains few rays short enough to affect bacteria except on prolonged exposure, or at higher temperatures which augment the effect of light.

We do not know the exact nature of the photochemical reactions produced in protoplasm by ultraviolet light, although various clues have been suggested. Bovie finds that paramecia exposed to a sublethal dose of ultraviolet light are so sensitized to heat that they cannot stand, even for sixty seconds, a temperature which is the optimum for the controls. He concludes that death from ultraviolet light is due to heat coagulation following sensitization by radiation. Others have found that the effect of ultraviolet light on protein solutions is to make them less soluble, as indicated by their easier precipitation.

Snow blindness depends on the reflection of ultraviolet rays from large areas of water and snow fields, these short rays being absorbed by the cornea and conjunctiva with resulting injury to their protein constituents. Any artificial illuminants, such as the quartz mercury arc and bare metallic arcs, which emit a large amount of radiation of a wave length less than 295 microns, are known to be extremely injurious to the eyes. These short rays are the ones that stimulate the formation of lymphocytes in man and animals, which may be a factor in the heliotherapy of tuberculosis. Light exerts some influence on body metabolism, as is shown by a number of results indicating a change in the amount of carbon dioxid expired, a change in rate and depth of respiration, and an increased rate of growth in the light compared to the dark. However, the effects are not as great as might be expected, presumably because the chemically active rays cannot penetrate deeply.

1. Hess, A. F.: Newer Aspects of the Rickets Problem, J. A. M. A. 78: 1177 (April 22) 1922.
2. Clark, Janet H.: The Physiological Action of Light, Physiol. Rev. 2: 277 (April) 1922.

A remarkable phenomenon produced by light is that of photodynamic sensitization, in which, through the action of various chemicals, the tissues are sensitized, just as one sensitizes a photographic plate, so that they are affected by visible light rays as normal cells would be by ultraviolet rays. Among the substances producing this effect is hematoporphyrin, derived from hemoglobin, which so sensitizes animals that sunlight is promptly fatal. Possibly the skin reactions of pellagrins to exposure to light depend on such sensitization.

As yet, relatively little investigation has been made as to how heliotherapy produces its effects in tuberculosis and rickets. In the latter, roentgenoscopy discloses that under the influence of sunlight the recalcification of bones proceeds at an accelerated rate, and chemistry reveals an increase in the inorganic phosphorus of the blood. Cod liver oil does much the same thing, and it is difficult to understand how sunlight and the oil can produce similar effects.

The physicists and biochemists will have to determine the explanation of the effects produced by the sun's rays; for the clinician it is important to realize that we are only at the threshold of the subject of the physics and physiology of light, and that, as these advance, new and probably unexpected therapeutic advances will also come.

SIGNIFICANCE OF THE KETOGENIC-ANTIKETOGENIC BALANCE IN DIABETES

When for any reason carbohydrate is inadequately oxidized in the body, the so-called "acetone bodies"—acetone, acetoacetic acid and beta-hydroxybutyric acid—may make their appearance in the urine as products of abnormal metabolism. The reason for this has not been clear heretofore, nor have the precursors of the acid compounds been precisely established. In a general way it has been realized that ketonuria or ketosis is dependent, among other things at least, on an altered breakdown of fats. The widely quoted generalization that "fats burn in the flame of the carbohydrates" throws little light on the chemistry of the reaction, and Woodyatt's [1] clever version, that when the proportion of fat is too great for the fire it "smokes" with unburnt fats and acetone bodies, was obviously intended only as a fanciful analogy.

Shaffer [2] of the Washington University School of Medicine has developed the theory that acetoacetic acid itself is not easily burned in the body, but that it forms with glucose, or with degradation products of glucose and related substances, a compound which is easily burned. To compounds which give rise, in the progress of metabolism, to acetoacetic acid the name "ketogenic" is given, while the name "antiketogenic" has been applied to compounds which furnish glucose or other related compounds with which the acetone body combines. The ketogenic compounds contained in the diets include the fatty acids contained in the fats, and some of the amino-acids, such as leucin and tyrosin, derived from the proteins. The antiketogenic substances are derived not only from the carbohydrates furnished preformed but also from the glucose derived in the metabolism of proteins, for it is well known that the latter yield glucose in large amounts readily demonstrable in severe diabetes. There is, further, evidence that glycerol yields glucose under some conditions; and hence fat, from which glycerol is produced by hydrolysis in the organism, must also be considered as a possible source of antiketogenic compounds.

If these considerations are to any extent valid, it becomes evident that there is a sort of ketogenic-antiketogenic balance in the body. So long as an abundance of carbohydrate can be burned with ease, the appearance of ketone substances will be averted, as they are in truth in the everyday life of healthy persons. As soon as carbohydrate tolerance is lowered, however, it must be assumed that ketosis can be avoided only by controlling the antagonistic factors so that either the antiketogenic components will be increased, or the sources of acetoacetic acid and its concomitants decreased.

The most recent clinical observations harmonize with the theoretical assumptions, and promise to pave the way for distinct advances in the management of diabetes.[3] The practical problem consists in determining how to estimate the ketogenic and antiketogenic values of the protein, fat and carbohydrate in any given diet. There are indications that this can be done. Shaffer [4] has lately asserted that the minimal amount of food carbohydrate needed to provide a theoretical ketogenic balance can be approximately calculated for any given subject; and this figure is the absolute minimum of carbohydrate tolerance below which ketosis is unavoidable. If, Shaffer adds, a diabetic has enough carbohydrate tolerance to remain "sugar-free" on a diet containing the calculated amount (or more) of food carbohydrate, he will have little or no ketosis. The calculated amount allows no margin of safety against accidental increase in total metabolism from unusual activity or infection. If the tolerance is lower, the only recourse is to reduce the total metabolism (the amount of ketogenic material in the metabolic mixture) by rest, low protein diet, undernutrition or fasting until the estimated appropriate relationship is established.

Hubbard and Wright [5] likewise have shown at the Clifton Springs (N. Y.) Sanitarium that the level of acetone excretion changes with altered dietary intake

1. Woodyatt, R. T.: Acidosis in Diabetes, J. A. M. A. **66**: 1910 (June 17) 1916.
2. Shaffer, P. A.: Antiketogenesis, I, An In Vitro Analogy, J. Biol. Chem. **47**: 433 (July) 1921; Antiketogenesis, II, The Antiketogenetic Balance in Man, ibid. **47**: 449 (July) 1921; Antiketogenesis: The Ketogenic-Antiketogenic Balance in Man and Its Significance in Diabetes, ibid. **50**: 26 (Feb.) 1922.
3. Woodyatt, R. T.: The Objects and Method of Diet Adjustment in Diabetes, Arch. Int. Med. **28**: 125 (Aug.) 1921.
4. Shaffer, P. A.: Antiketogenesis: The Ketogenic-Antiketogenic Balance in Man and Its Significance in Diabetes, J. Biol. Chem. **50**: 26 (Feb.) 1922.
5. Hubbard, R. S., and Wright, F. R.: Studies on the Acetonuria Produced by Diets Containing Large Amounts of Fat, J. Biol. Chem. **50**: 361 (Feb.) 1922.

in correspondence with the principles just enunciated. According to them it appears that the mechanism which controls the formation of increased amounts of the acetone bodies can be regarded as a molecular reaction or balance between ketogenic substances, such as the fatty acids, and antiketogenic substances, such as glucose: that protein figures as an antiketogenic compound only to the extent of the glucose which it can yield in the organism; that glycerol, when fed as a part of the fat molecule, figures as an antiketogenic compound only to the extent to which it forms glucose in the organism; and probably that glycerol so fed does figure as an antiketogenic compound to the extent to which glycerol itself can yield glucose. It represents a decided advantage to be able, as Shaffer, Woodyatt, Hubbard and their collaborators have proposed, to calculate the "ketogenic balance" of any proposed diet and make favorable readjustments in accord with its indications, and have outlined suitable methods. The value of precise knowledge regarding protein and fat intakes or breakdown, as well as carbohydrate consumption, thus becomes clearer. The tolerance for fat becomes something measurable and predictable. The dietotherapy of diabetes will benefit by the newer knowledge which directs attention to the interrelations of all the nutrients and to the necessity and methods of taking into account the protein and fat as well as the tolerated carbohydrate of the patient.

Current Comment

THE IDENTITY OF BENCE-JONES PROTEIN

The so-called "Bence-Jones protein," which has long been known to physiologic chemists as a peculiar albuminous substance occurring in rather rare instances in the urine of man, should be regarded as something more than a mere medical curiosity. The fact that this unique protein has not been identified in the normal body and that it has frequently, though by no means exclusively, been found in cases of multiple myeloma serves to direct attention to its possible diagnostic importance, and also to its problematic significance in the pathology or pathogenesis of certain disease states. Many of the earlier ideas in regard to this abnormal urinary component have been abandoned in the light of chemical investigation. The Bence-Jones protein is no longer regarded as an "albumose," despite its proteose-like behavior in the urine; nor is it considered to be a mere degradation product of ordinary proteins. Some recent writers have favored the contention of Simon that it is most closely related to one of the globulins of the blood.[1] A few, however, have argued, on the basis of immunologic differences, for a sharp differentiation between the Bence-Jones products and the proteins of human serum.[2] Bayne-Jones and Wilson[3] of the Johns Hopkins Medical School have been fortunate in securing a specimen of Bence-Jones protein which could be thoroughly purified by crystallization, and thus freed from other proteins which may be present in abnormal urine. The latter, as they occur in familiar albuminurias, are commonly regarded as having their origin in the blood, and as being identical with the serum proteins. A comparison of the refined Bence-Jones protein and the proteins of normal serum by use of highly specific precipitin, complement-fixation and anaphylactic reactions revealed unmistakable differences. Whether there is only one protein or many unlike proteins of the Bence-Jones type cannot yet be definitely stated. Most preparations heretofore secured have unquestionably been contaminated or admixed with other urinary albuminous constituents. In any event, the Bence-Jones protein must be regarded as *sui generis*. Bayne-Jones and Wilson take occasion to point out, on the basis of the immunologic differences observed in their experiments, that these are further evidence in support of the conception that the specificity of proteins is not dependent on their biologic origin, but is due to some feature of their chemical composition.

VISUALIZING OUR COMPOSITION

In medicine we often get so close to the details that we do not see the whole; so close to the forest that we cannot see the woods for the trees. This is especially true in respect to things that are examined with the microscope or determined by microchemical methods. Luden[4] has called attention to this tendency, and points out a number of quantitative facts that are somewhat startling. For example, the entire volume of circulating blood, which about half fills an ordinary bucket, contains only a small teaspoonful (from 4 to 6 gm.) of sugar and a tablespoonful (32 gm.) of salt. When we consider the minute variations in the sugar content that the modern chemist can measure in a few drops of blood, we gain added respect for the science of quantitative analysis. The iodin in the entire blood amounts to but 0.01 gm., or an average dose of atropin. When the physiologist tells us that epinephrin can be detected by biologic methods in a dilution of 1: 330,000,000, it means far less than to say that it is equivalent to diluting "a small glass of whisky (10 c.c.)" —a very small glass, that—into the contents of 1,320 city street sprinkling carts, which would form a procession about six miles long. We all know that the normal blood contains about 5,000,000 red corpuscles in each cubic millimeter, but do we all realize that the entire blood must therefore contain some 25 trillion (25,000,000,000,000) red cells and 30 billion leukocytes, figures that have an astronomical aspect? And do we realize that in all that mass of blood is distributed the insignificant quantity of from 1 to 3 grains (65 to 200

1. Wells, H. G.: Chemical Pathology, 1920, p. 526, which contains an elaborate review of the literature of the subject.
2. Massini, R.: Deutsch. Arch. f. klin. Med. **104**: 29, 1911. Hektoen, Ludvig: Specific Precipitin for Bence-Jones Protein, J. A. M. A. **76**: 929 (April 2) 1921.
3. Bayne-Jones, S., and Wilson, D. W.: Immunological Reactions of Bence-Jones Proteins, I, Differences Between Bence-Jones Proteins and Human Serum Proteins, Bull. Johns Hopkins Hosp. **33**: 37 (Feb.) 1922.
4. Luden, Georgine: The Importance of Visualizing Established Scientific Data with Reference to the Size of the Body Cells and Their Chemical Supplies in the Circulating Blood, Endocrinology **5**: 715 (Nov.) 1921.

mg.) of uric acid, which we assay accurately and speculate about vaguely? Luden quotes an amusing, if not very precise, estimate of the total chemical composition of "the average man," which has recently been published by a big industrial company, and which may be thus summarized: fat enough for seven bars of soap; iron enough for a medium-sized nail; sugar enough to fill a shaker; lime enough to whitewash a chicken coop; phosphorus enough to make 2,200 match-tips; magnesium enough for a dose of magnesia; potassium enough to explode a toy cannon, and sulphur enough to rid a dog of fleas. Many items in this estimate are left largely to the imagination, such as the size of the dog and the number of his tormentors, but the total cost of the ingredients is given as 98 cents, which is neither expensive nor calculated to foster megalomania. The practical value of visualized scientific data lies not only in the stimulation of memory through the imagination, but also in the food for thought which they offer and in their bearing on great medical problems. If mental pictures of the billions and trillions of blood cells crowding, jostling, and possibly struggling for a share of the mere teaspoonful of sugar in the total blood volume of a full-sized man, or the endless procession of sprinkling carts representing the epinephrin concentration to which animal tissues respond, appeal to one's sense of humor, they also do much more than this: They bring home the delicacy of the adjustment by which the human body mechanism is regulated; the extent to which this fine adjustment may be disturbed by seemingly trivial factors; the obligation of both laymen and physicians not to ignore the "slight" tokens of distress of the body engine, and the value of comparing the quantities used in the body chemistry with the "dosage" in therapeutics.

DYSPNEA IN CARDIAC DISEASE

It is well known that patients with heart disease may become "short of breath" as the result of an amount of exercise that does not similarly affect normal persons. Recent studies of Peabody and Sturgis [1] on persons thus experiencing dyspnea after moderate exertion indicate that the rise in metabolism, heart rate and pulmonary ventilation in patients with cardiac disease following a given amount of exercise is proportionally the same as that observed in normal persons. The dyspnea is therefore not attributable to any undue increment in metabolism with an augmented production of excretory products. Peabody and Sturgis rather attribute the shortness of breath in these patients to their tendency to breathe less deeply than normal persons, with the result that the total pulmonary ventilation becomes greater in order to obtain the same effective alveolar ventilation. A second contributory factor is the circulation of these patients, which becomes inadequate during the strains imposed by exercise and consequently contributes delay in the elimination of carbon dioxid, one of the most important stimuli to the respiratory center.

1. Peabody, F. W., and Sturgis, C. C.: Clinical Studies on the Respiration, IX, The Effect of Exercise on the Metabolism, Heart Rate and Pulmonary Ventilation of Normal Subjects and Patients with Heart Disease, Arch. Int. Med. **29**: 277 (March) 1922.

Association News

ST. LOUIS SESSION

Luncheon for Rotarians

All Rotarians who attend the Annual Session are requested to register at the Club Headquarters—Mezzanine Floor, South, Hotel Statler. A luncheon will be given under the auspices of the St. Louis Rotary Club in Parlor "A" of that hotel, Thursday, May 25.

Air Service Medical Association

The Air Service Medical Association of the United States will hold its annual meeting at St. Louis on Tuesday, May 23, at the Clinical Building, Washington University Medical School, Euclid and Scott avenues.

Schedule of Clinics to Be Held Prior to the Meetings of the Sections, May 18-23

ALEXIAN BROTHERS' HOSPITAL.—May 19 and 20, 9-12: *General Surgery*, Carroll Smith. *Genito-Urinary*, J. W. Marchildon. *Medicine*, E. P. Budde. *Neurology*, Hillel Unterberg. May 18 and 20, 2-5 p. m.: *Ear, Nose and Throat*, S. S. Burns. May 19 and 22, 2-4: *Eye*, J. M. Keller.

BARNARD SKIN AND CANCER HOSPITAL, 3427 Washington Avenue.—May 22, 10-12: 30, and 2-4: *Dermatology, Surgery, Gynecology, Pathology.*

BARNES HOSPITAL, ST. LOUIS CHILDREN'S HOSPITAL, 4945 Kingshighway Boulevard.—May 18-23, 9-12: *Surgery, Medicine, Pediatrics, Obstetrics.*

WASHINGTON UNIVERSITY MEDICAL SCHOOL.—May 18-23: *Department of Biological Chemistry:* Demonstrations of Methods of Blood Chemistry and of Basal Metabolism by members of the staff. *Department of Anatomy:* Demonstrations in the Museum of Topographical Anatomy. *Physiological Laboratory:* Demonstration of Procedure of Investigating the Accuracy of the Methods of Blood Pressure.

BETHESDA HOSPITAL, 3659 Vista Avenue.—9-12: *General Surgery*, Roland Hill.

CITY HOSPITAL, UNIT NO. 3, Fourteenth and Lafayette Avenues.—*Surgery*, daily, 9-12. *Gynecology*, daily, 10-12. *Medicine*, daily, 9-12. *Genito-Urinary*, Monday, Thursday and Saturday, 1-3. *Ear, Nose and Throat*, Monday, Thursday and Saturday, 2-4.

CITY HOSPITAL NO. 2, 2945 Lawton Street.—*Neurology*, May 18 and 20, 10-11, J. F. McFadden.

DEACONESS HOSPITAL, 4125 West Belle Place.—May 18, 9-10: *Gynecology*, Lee Dorsett. 10-12: *Surgery*, H. L. Nietert. May 19, 9-10: *Orthopedics*, F. H. Albrecht. 9-11: *Surgery*, F. L. Reder. 9-1: *Surgery*, E. A. Babler. 11-12: *Medicine*, L. H. Hempelmann and Schreffler. May 20, 9-10: *Urology*, Herluf G. Lund. 9-1: *Surgery*, E. A. Babler. May 21, 10-12: *Surgery*, Shutt. 11-12: *Medicine*, L. H. Hempelmann and Schreffler.

JEWISH HOSPITAL, 5415 Delmar Boulevard.—May 18, 9-10: Phil Hoffmann. 9-11: Harry Sandperl. May 19, 9-11: R. Y. Tilles. 2-4: Barney Brooks. May 21, 2-4: Ernest Sachs. May 22, 8: 30-10: H. W. Loeb and S. B. Westlake. 2: L. K. Guggenheim. 2: Meyer Wiener.

LUTHERAN HOSPITAL, Ohio and Potomac Streets.—May 20, 8-10: Robert E. Schlueter.

MULLANPHY HOSPITAL, Montgomery near Grand.—May 18, 8-10: Robert E. Schlueter.

MISSOURI BAPTIST SANITARIUM, 919 North Taylor Avenue.—May 18, 9: *Medicine*, L. H. Behrens and George Ives. 9: *Surgery*, W. S. Wiatt and Willard Bartlett. *Gynecology*, H. M. Lowenstein. May 19, 9: *Medicine*, O. H. Campbell. *Surgery*, Hudson Talbott and Willard Bartlett. *Neurology*, F. R. Fry. *Orthopedic Surgery*, M. L. Klinefelter. *Surgery*, V. P. Blair May 20, 9: Staff meeting. May 22, 9: *Medicine*, C. H. Neilson. *Genito-Urinary*, C. E. Burford. *Surgery*, Drs. Talbott, W. S. Wiatt and Willard Bartlett. *Orthopedic Surgery*, M L. Klinefelter. *Otolaronology*, Selden Spencer.

ST. ANTHONY'S HOSPITAL, Grand and Chippewa Streets.—May 18, 9-11: *Surgery*, Willis Young. May 18, 20 and 23, 9-12: *Maxillofacial Plastic and General Surgery*, H. S. McKay and F. J. Tainter. May 20 and 23, 9-12: *Medicine*, J. C. Lyter. Pathogenic, clinical and experimental demonstrations. *Genito-Urinary*, Neil S. Moore.

ST. JOHN'S HOSPITAL, Euclid and Park View Place.—May 19 and 20, 3-5: *Endocrinology*, William Engelbach and J. L. Tierney. Conducted by: Llewellyn S. Barker, Baltimore. David Riesman, Philadelphia. Nelson W. Janney, Los Angeles.

ST. LOUIS BAPTIST HOSPITAL, 2945 Franklin Avenue.—May 19, 8-10: *Genito-Urinary Surgery*, M. E. Hagerty. 9-11: *Plastic Bone Surgery*, Arthur Gundlach; demonstration of two cases. 9-10: *Roentgen-Ray Clinic*, M. B. Titterington. May 20, 8-10: *Plastic Bone Surgery*, F. L. Morse. 8-12: *Surgery*, John D. Hayward. 12-1: Buffet luncheon. 10-12: *Diseases of the Chest*, Solon Cameron. May 22, 8-12: *Surgery*, E. H. Johnson. 12-1: Buffet luncheon. 2-4: *Laboratory Demonstrations*, R. B. H. Gradwohl. 1-5: *Eye, Ear, Nose and Throat*, A. S. Steiner. May 23, 8-10: *Surgery*, H. C. Bohrer. 10-12: *Surgery*, C. C. Morris. 12-1: Buffet luncheon. 1-5: *Ear, Nose and Throat:* Tonsillectomies; Local and Gas Anesthesias; Septum Operation; Esophageal Examination, E. Lee Meyers. 1: 30-4: *Genito-Urinary Surgery*, W. E. Jost.

ST. LOUIS UNIVERSITY MEDICAL SCHOOL.—Laboratory Demonstrations, dates to be announced later.

ST. LUKE'S HOSPITAL, Delmar and Belt Avenues.—May 18-23, 9-12: *Medicine and Surgery.*

ST. MARY'S INFIRMARY, 1536 Papin Street.—May 18, 9-10: *Empyema, Local Anesthesia. Vaginal Hysterectomy for Carcinoma,* John M. Dean. 11: *Empyema, Paroxysmal Tachycardia,* Fritz Neuhoff. 2-4: *Eye,* W. H. Luedde and J. F. Hardesty. May 19, 9: *Retroversion of Uterus; Repair of Perineum.* 10: *Cholecystitis,* Louis Rassieur. 11: *Hypertension Disease; Cardiorenal,* A. P. Henske. 1-2: *Neurology,* F. M. Barnes and Elliott. 4: *Genito-Urinary,* C. E. Burford, Koenig, M. L. Custer and H. H. Kramolowsky. May 20, 9: *Thyroidectomy for Toxic Goiter.* 10: *Cholecystectomy for Gallstones.* 11: *Diverticula of Jejunum,* J. F. Clancy. 2: *Diseases of Children,* J. F. Clancy. May 22, 9: *Transposition Operation for Uterine Prolapse.* 10: *Thyroidectomy, Toxic Goiter, Local Anesthesia,* J. M. Dean. 11: *Treatment of Bronchial Asthma by Defibrinated Blood; Pulmonary Tuberculosis,* A. C. Henske. 2-4: *Children's Diseases,* J. P. Costello. May 23, 9: *Gallstones.* 10: *Umbilical Hernia,* Louis Rassieur. 11: *Duodenal Tube.* 2-4: *Tonsils and Adenoids* (ten cases); *Deviated Septum; Mastoid Operation,* S. B. Westlake and Schmit.

Physicians attending these clinics are requested to register at the office of the St. Louis Clinics, 3525 Pine Street, giving their St. Louis address so that the daily bulletins may be mailed to them.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARKANSAS

Special Course in Venereal Disease.—The U. S. Public Health Service conducted a special thirty-day course in venereal disease control at the new government clinic at Hot Springs in April.

CALIFORNIA

Hospital News.—The forty-five physician stockholders comprising the Sutter Hospital Association have accepted plans for the Sutter Hospital, to be erected in Sacramento. The hospital will contain wards and private rooms and the beds in the wards will be separated by partitions. There will be a large solarium on the roof. The institution is partially financed by the Bank of Italy.——Contracts have been awarded for the new U. S. Veterans' Bureau hospital at Palo Alto, consisting of twenty-two new concrete buildings, which will be erected at a cost of $861,969. The contract, of which the full amount is $1,154,309, also includes the building of roads and completing of the grounds of the institution. The present structures will be torn down and the new hospital completed within eight months. Contracts have also been let for mechanical equipment, heating and lighting at a cost of $292,400.——Medical superintendents of the state hospitals and homes in California held a two-day session in San Diego, April 24-25.

CONNECTICUT

Health Institute.—The New England Health Institute was held in Hartford, May 1-6. Public health workers from all parts of New England were present, and prominent public health speakers addressed the meetings.

Personal.—Dr. Roy L. Leak has been appointed superintendent of the Connecticut State Hospital, Middletown, to succeed Dr. Clarence Floyd Haviland, who resigned recently. ——Dr. James H. Kingman, Hartford, was elected president of the Middlesex County Medical Association at its one hundred and thirtieth annual meeting.

DELAWARE

Personal.—Dr. Joseph P. Wales, Wilmington, has been appointed by the governor a member of the state board of health to succeed Dr. Charles A. Ritchie, who resigned recently.——Dr. Charles M. Hanby, president, and Dr. Harvey Murray have been reelected members of the state board of health.

DISTRICT OF COLUMBIA

Physicians' Organization.—The Wapiya (Sioux Indian name for medicine men) was organized the latter part of 1921, in Washington, and consists of 100 members of the University Club of the city. The officers of the Wapiya have Sioux Indian names also, Dr. Noble P. Barnes, president, "Itanca," and Dr. Everett M. Ellison, secretary-treasurer, "Wowabkaga."

Prevention of Venereal Disease.—Senator Owen of Oklahoma has introduced a bill in the senate for the prevention, treatment and detection of venereal diseases in the District of Columbia. The bill is a duplicate of the measure presented to the House of Representatives and favorably reported by Representative Gilbert, in March. It gives the district health officer the power to go into court and compel the examination of persons suspected of having venereal diseases. It also provides for the registration by physicians of all cases of venereal diseases, without revealing the identity of the patients.

FLORIDA

Physician Must Serve Term.—It is reported that Dr. R. C. Hammers, former Tampa physician, convicted five years ago of violation of the Harrison Narcotic Law, must serve four and one-half years at hard labor, under a recent decision of the United States Court of Appeals.

State Medical Meeting.—The forty-ninth annual meeting of the Florida Medical Association will be held in Havana, Cuba, June 27-28, not, as previously announced, on June 30. Connections will be made at Key West, from which port the S. S. *Cuba* will sail, Monday, June 26, at 9:10 a. m., arriving at Havana at 5 p. m. on the same day. Return excursion rates from Jacksonville will be $50.45. Association headquarters will be at Hotel Sevilla.

Board of Health News.—Dr. George A. Dame, director of the Bureau of Communicable Disease, is making, through its division of field service, brief surveys of each county, covering about 150 physical, sociologic and sanitary questions that frequently arise in the directing of public health activities in the state.——Capt. W. H. Gillette, U. S. Public Health Service, who has been detailed to the Bureau of Communicable Disease, Division of Venereal Disease Control, is carrying out an extensive program of lectures and motion pictures throughout the state on social hygiene.

ILLINOIS

Health Society.—The Illinois Health Society, with headquarters in Chicago, was recently granted a charter by the secretary of state. The incorporators are Dr. Isaac D. Rawlings, Springfield, and Dr. William A. Evans and Mary R. Plummer, both of Chicago.

Catholic Hospital Conference.—At the second Illinois conference of Catholic hospitals held recently, in Peoria, the eight-hour day in hospitals as a substitute for the twelve-hour day was voted on favorably. More than 500 sisters were in attendance. Rev. P. J. Mahan, Chicago, presided and gave the principal address.

Probe of Prescriptions.—According to Deputy Marshal J. J. Connors, Springfield, subpenas have been served on a dozen physicians of Peoria to appear before the federal grand jury for investigation into their prescription records, resulting, it is stated, from irregularities said to have been found in prescription records of a local physician.

New Bulletin on Milk.—The state department of public health announces that a new bulletin on safe milk supplies has just come from the press. Among other things is presented a suggested form for an effective milk ordinance suitable for cities throughout the state. There is also a list of milk pasteurization plants that operate in Illinois. Copies may be obtained on requests addressed to the director, State Department of Public Health, Springfield.

Health Promotion Week.—The governor has assigned May 7-13, as Health Promotion Week in the state to be conducted with a display of motion picture films, lantern slides, wall posters, the state department of public health's loan service of educational exhibit equipment, birth registration campaigns and better baby conferences. Ministers have been asked to choose, for the subject of a sermon on Sunday, May 7, a topic that will emphasize health promotion as a religious duty, and to announce Health Promotion Week to the congregations.

Sanitary Survey of Flooded Area.—The director of the state department of public health and other state officials made a survey of the flooded areas in the Illinois River valley, April 26, in order to consider the sanitary, relief and rehabilitation problems that have arisen at several points on account of the unusual inundation. As a result, several additional physicians attached to the state department of public

health have been detailed for duty in the valley, with instructions to carry out the sanitary precautions that are indicated. Particular emphasis is laid on the protection of drinking water supplies and the safe disposal of wastes. Every possible means is being employed to encourage general vaccination against typhoid fever.

Fear Smallpox Epidemic in Illinois.—Smallpox incidence in Illinois has been relatively very light during the first four months of the year but two or three smoldering foci have threatened, and still do threaten constantly, to flare up into serious epidemics of widespread proportions. At the present time the outbreak is more acute at Pekin than it is elsewhere. The situation there is all the more serious since Pekin is located on the Chicago-St. Louis hard road, and the fact that there is increased motor traffic from distant points at this season lends support to the fear of spreading the disease broadcast.——The number of smallpox cases reported to the state department of public health from Pekin has gradually increased since January 1, with a total of twenty-nine for April. During the same period, an average of seventy-one cases per month has been reported from Peoria County, 75 per cent. of which occurred in the city of Peoria. Out of 1,053 cases reported from the entire state during the four months, Peoria County registered 284, or more than one fourth. State health officers are investigating the situation, with a view of instituting effective control measures.

Chicago

Prof. Walter S. Haines Completes Fifty Years of Teaching.—In June, Prof. Walter S. Haines of Rush Medical College will complete fifty years of teaching in the department of materia medica and therapeutics. A banquet of Rush alumni will be held at the Congress Hotel, May 17, during the session of the Illinois State Medical Association, at which it is planned to give recognition to this unusual record of service.

Alumni Reunions.—The annual meeting and banquet of the Alumni Association, University of Illinois College of Medicine, will be held at the Congress Hotel, May 17. Speeches will be omitted.——The Alumni of Loyola University School of Medicine, Chicago, will hold their annual reunion and banquet at the Congress Hotel, May 17. Those wishing to attend may notify Dr. Thomas F. P. Walsh, president, 736 East Sixty-Third Street.

Henry B. Favill Lectures.—The National Tuberculosis Association recently requested the Chicago Tuberculosis Institute to cooperate with the Henry B. Favill School of Vocational Training and give a course of lectures to the students for the purpose of training vocational teachers to go into tuberculosis sanatoriums to organize vocational training among the patients. This work was assigned to Dr. Ethan A. Gray, who gave two courses, of five lectures each, to the students of the Henry B. Favill School.

INDIANA

Personal.—Dr. Charles S. Woods, Indianapolis, superintendent of the Methodist Hospital, was recently elected president of the Indiana section of the American Hospital Association, to succeed Dr. George F. Keiper, Lafayette.——Dr. Earl Ray Royer, formerly of Indianapolis, has just returned from South America, where for two years he was head of the Curifamba Hospital, Portovelo, Ecuador, and chief surgeon for the Guayaquil and Quito Railroad.

Hospital News.—A new county hospital will be erected at Decatur, at a cost of $85,000.——A thirty-five bed addition will be built at the Goshen Hospital early in the summer.——Forty-five acres of land has been purchased for use of the Marion County Tuberculosis Hospital, Sunnyside. Appropriations of $118,731 have been made.——A new hospital will be erected at Oxford in the near future.——The St. Joseph's and Epworth hospitals at South Bend will be enlarged to double their capacity. The St. Joseph addition will be erected at a cost of $250,000 and the Epworth Hospital will expend $150,000.——Construction work has been started on a hospital at Elwood.

IOWA

Physician Honored.—The Jefferson County Medical Society gave a dinner, April 15, at Fairfield, in honor of the fiftieth anniversary of Dr. Winfield Fordyce's practice in the county, where he opened an office, April 15, 1872, at Glasgow. Dr. Fordyce spoke on "Reminiscences."

County Societies and County Physicians.—Following a precedent established by Blackhawk County, the duties of the Mahaska County physician are to be assumed by the entire membership of the Mahaska County Medical Association. For this service, the association will receive $1,200 a year.

Venereal Disease Hospital.—A temporary building has been constructed east of the State University of Iowa Hospital, Iowa City, to be used as a venereal disease hospital, with a forty-bed capacity. The purpose of this institution is to cooperate with the U. S. Public Health Service and the state board of health in their effort to suppress venereal disease and to increase the facilities available for that phase of the work. Dr. N. G. Alcock, professor of genito-urinary diseases, will be in charge.

Personal.—Dr. William Bruff, Atlantic, recently sailed for Seoul, Korea, where he will teach bacteriology in Serrerance.——Dr. W. H. Bell, Fontanelle, has returned from two and one-half years spent in Turkey with the American Red Cross for which he was decorated by the Turkish government.——Dr. Ralph W. Mendleson, formerly of Des Moines, has been given the order of the White Elephant by the government of Siam and the order of St. Sava, by the Serbian government, in recognition of his work in sanitation with those governments.——Dr. William A. Rohlf, Waverly, was reelected president of the Medical Life Insurance Company, recently.

LOUISIANA

New Laboratory Established.—The state board of health has established a branch laboratory in Monroe, to look after the work of northwestern Louisiana. The laboratory is a public health laboratory and will accept no fees.

Physician Honored.—The Orleans Parish Medical Society presented Dr. Ernest Sidney Lewis, New Orleans, with a loving cup, April 24, in commemoration of the completion of his sixtieth year in the active practice of medicine. Dr. Lewis is in his eighty-second year.

MARYLAND

De Lamar Lectures.—Dr. John P. Lotsy, research fellow of the Dutch Society of Sciences, Holland, gave a lecture on "The Species—Concept in Evolution and Hybridization" at Johns Hopkins University, Baltimore, May 1, under the De Lamar course of lectures in hygiene.

Plans for Opening a Negro Clinic.—Plans for the opening of a clinic for venereal diseases in the Provident Hospital for negroes have been completed. Two negro physicians and a negro social worker will have charge of the clinic, which is under the direction of the Baltimore City Health Department.

Physician Receives Appointment.—Dr. Harry Richmond Slack, Jr., associate professor of laryngology, Johns Hopkins University Medical Department, Baltimore, has been appointed exchange professor to the Union Medical College, Peking, China. Dr. Slack will be professor of otolaryngology and organize and preside over that department. He will sail in August and will be away one year.

Personal.—Dr. Joseph C. Bloodgood, Baltimore, is one of ten men selected from the 20,000 alumni of the University of Wisconsin in this country for a place in the Wisconsin Hall of Fame.——Dr. Joseph C. Swenarton has been appointed assistant director of the bureau of bacteriology of the Baltimore City Health Department. Dr. N. G. Mydrea gave a lecture recently before the members of the Contemporary Club, Baltimore, on English hospitals in Arabia.

Medical and Chirurgical Faculty of Maryland.—At the one hundred and twenty-fourth annual convention of the faculty, held in Baltimore, April 25-27, under the presidency of Dr. Arthur H. Hawkins, the following officers were elected for the ensuing year: president, Dr. Herbert Harlan, Baltimore; vice presidents, Drs. James M. H. Rowland, Harry Friedenwald and Peregrine Wroth, Jr.; secretary, Dr. Joseph Albert Chatard, and treasurer, Dr. Charles E. Brack.

MASSACHUSETTS

Meeting of Physicians.—The fifty-fourth meeting of the Massachusetts Association of Assistant Physicians of the department of mental diseases was held at the Waverly School for the Feebleminded, Waverly, April 26.

MICHIGAN

New Director of Child Hygiene.—Dr. Blanche M. Haines, Three Rivers, has been appointed director of child hygiene and public health nursing of the state department of health

by the commissioner of health, to succeed Miss Harriet Peck, May 15. The appointment of Dr. Haines is in keeping with the federal policy of having a physician in charge of child hygiene work in each of the states administrating Sheppard-Towner Bill funds.

Banquet for Physicians.—The Wayne County Medical Society gave a banquet, April 28, in Detroit, as a token of appreciation of the record of twenty-eight physicians who have practiced for forty years in the same community. Dr. H. Wellington Yates was toastmaster. The honor guests at the banquet were: Drs. John E. Clark, C. Henri Leonard, Jay M. Burgess, Beverley D. Harrison, William C. Stevens, Oscar S. Armstrong, Daniel R. Donovan, Charles Douglas, W. P. Manton, Daniel LaFerté, Charles G. Jennings, Lewis E. Maire, Willard Chaney, William R. Chittick, John K. Gailey, John T. Hornbrook, Albert B. Lyons, Stanley G. Miner, Ernest Schorr, John R. Shaffer, Irwin S. Townsend, Daniel Geib, Eugene Smith, Sr., John R. Jones, Justin E. Emerson, Carl Bonning, Joseph Schulte and Oscar LeSeure.

MINNESOTA

New Surgical Society.—The Minneapolis Surgical Society has recently been organized in that city, with a charter membership of twenty-four. Dr. Roscoe C. Webb was elected president of the society, and Dr. Arthur A. Zierold, secretary-treasurer.

Annual Clinic Week.—The fifth annual Minneapolis Clinic Week was conducted, April 10-15, under the auspices of the Hennepin County Medical Society. The annual banquet of the society was held, April 11, at which Lieutenant-Governor Collins and Dr. Jabez N. Jackson, Kansas City, were the principal speakers.

MISSOURI

Honorary Degree for Physician.—At the eighth annual commencement of the University of Missouri at Columbia, Dr. Richard L. Sutton, Kansas City, was presented with the honorary degree of doctor of laws.

NEW YORK

Hospital News.—The new Soldiers' and Sailors' Memorial Hospital at the State Masonic Home, Utica, was formally dedicated by the Freemasons, April 22. The hospital was erected under the supervision of the war relief administrations of the fraternity and has a capacity of 232 beds.——A building fund has been collected for the erection of a $225,000 building for St. Mary's Hospital, Rochester.

New York City

Gift to Hospital.—A gift of $20,000 has been made by Edwin Gould to St. Mark's Hospital. The money will be used to help pay off the mortgages on the hospital buildings. Mr. Gould has offered an additional $10,000 if others will contribute the $47,000 needed to clear the indebtedness on the main building.

Funeral Services for Surgeon-General Sutton.—Military and Masonic funeral services were held in St. Agnes Chapel, April 30, for Dr. McWalter B. Sutton, surgeon-general of the United American War Veterans, who died, March 29, in Hamburg, Germany. Dr. Sutton served as an officer in the Spanish-American War, and in the World War was surgeon on several army transports. He accompanied the American Red Cross expedition to Russia in 1918.

Dinner to Dr. S. Josephine Baker.—About 300 men and women, including physicians, social workers and members of the nursing profession, attended the dinner, April 26, given to Dr. S. Josephine Baker, head of the bureau of child hygiene of the New York City Health Department, at the Hotel Commodore, who has been appointed by State Health Commissioner Herman M. Biggs as consultant in child hygiene in connection with the organization of a new division in the state department of health provided by the Davenport law.

NORTH CAROLINA

Tuberculosis School.—A tuberculosis school will be conducted by the U. S. Public Health Service, June 1-30, at the government tuberculosis sanatorium in Oteen, N. C. The class will consist of thirty medical officers and thirty nurses, who will be drawn for the most part from other public health service hospitals. A few others who are identified with tuberculosis work in different parts of the country, although not employed by the government, will be admitted. The first school, which graduated twenty-two physicians and nineteen nurses who had been selected from the fifty-six hospitals of the service, was patterned after the summer school at Saranac Lake, N. Y., with necessary adaptations to the special work required. This sanatorium was built during the war by the Army and was later turned over to the U. S. Public Health Service.

OREGON

Society Changes Name.—The name of the Portland Ophthalmological and Oto-Laryngological Society has been changed to the Oregon Academy of Ophthalmology and Oto-Laryngology. The officers for the ensuing year are: president, Dr. C. Gertrude French, The Dalles, and secretary-treasurer, Dr. Andrew J. Browning, Portland.

PENNSYLVANIA

Social Workers Meeting.—A district meeting of the American Association of Hospital Social Workers was held in Philadelphia, May 1. Dr. Daniel J. McCarthy, professor of medical jurisprudence, University of Pennsylvania, spoke on "Social Service and Efficiency."

Compensation for Children.—According to a decision handed down recently by the compensation referee at Philadelphia, child workers between the ages of 14 and 16 who are injured on their way to continuation school are entitled to the benefits of the workman's compensation act.

Personal.—Dr. James A. Irwin, Philadelphia, will sail in May for an extensive tour of Europe and the British Isles. ——Prof. D. Wright Wilson, Ph.D., professor of physiologic chemistry, Johns Hopkins Medical School, Baltimore, has been appointed to fill a similar position at the University of Pennsylvania, to succeed Dr. Alonzo E. Taylor.

Beds for Tuberculous Patients.—Less than 700 beds are provided for the use of patients suffering from advanced tuberculosis in Philadelphia, when the accepted standard calls for one available hospital bed in a community for each death from tuberculosis in the year. This would require the city of Philadelphia to maintain approximately 2,500 beds for this purpose.

Hospital News.—The site of a new tuberculosis hospital has been selected in Butler Township, comprising forty-five acres located near the Kis-Lyn school. The cost of the ground was $12,000. Plans for the building have already been made.——The Andrew Kaul Memorial Hospital, St. Mary's, will soon be ready for occupancy.——At a meeting of the Pennsylvania Mystic Shrine, at Harrisburg, Philadelphia was selected as the site for a $500,000 Shrine home for crippled children.——A recent survey of Philadelphia city hospitals revealed a dearth of accommodations for private patients. At the Jefferson Hospital, patients are forced to register weeks in advance. The situation has become so serious that the hospital will erect a new building. It will be fourteen stories high and will be constructed at a cost of $1,500,000. The institution will be opened to the public in one year.

SOUTH CAROLINA

Palmetto Medical Association.—The twenty-seventh annual meeting of the association was held at Aiken, April 25-28. Dr. William M. Thorne, Charleston, was elected president of the association and Dr. C. C. Johnson, Aiken, secretary. The next annual meeting will be held at Camden, in April, 1923.

Health Campaign.—Under the direction of the South Carolina Board of Health and the U. S. Public Health Service, a health campaign will be conducted for a period of one year in Greer. One half of the expense will be borne equally by the state and the International Health Board, the other half jointly by the town of Greer and the cotton mill interests of that place.

TENNESSEE

Offices of Journal Moved.—The offices of the *Journal of the Tennessee State Medical Association* have been removed to the office of Dr. Larkin Smith, Nashville, the new secretary of the association, who succeeded Dr. Olin West.

TEXAS

Personal.—Dr. William G. Howell, associate physician at Cragmor Sanatorium, Colorado Springs, Colo., has been appointed director of the new Baptist sanatorium at El Paso. ——Dr. Clarence W. Coutant, medical director of the South-

ern Baptist Sanatorium, El Paso, has resigned to become assistant to the medical officer, Fourteenth District, U. S. Veterans' Bureau, Dallas.——Dr. William S. Carter, head of the department of physiology, University of Texas Medical Department, Galveston, has left for the Philippine Islands to represent the Rockefeller Foundation in the University of the Philippines, College of Medicine and Surgery, Manila.

VIRGINIA

New Wing at Hospital.—Gifts of $60,000 have been made for the construction of an orthopedic wing to the University of Virginia Hospital, Charlottesville.

WASHINGTON

Medical Golf Day.—The Seattle Golf Club was the scene of Medical Golf Day, April 27. The entire day was given over to the game. Vancouver and Victoria, B. C., sent over a team of their best players, and in the evening the golfers' annual banquet was held.

WISCONSIN

County Clinic.—The first clinic in Waukesha County for crippled children was held in Waukesha, April 15. The Waukesha Red Cross engaged Dr. J. O. Deiterle, Milwaukee, to conduct the clinic.

Registration for Nurses.—The bureau of nursing education of the Wisconsin State Board of Health is endeavoring to spread knowledge of the necessity for all nurses practicing in that state as graduate nurses to possess a reregistration card issued by that office. The new law requires an annual reregistration by such nurses, to make their practice legal. It is specifically required that all who work as trained, graduate, certified or registered nurses shall hold a certificate from the state board of nurse examiners. The attention of nurses, especially the older graduates, is called to the fact that, if their certificates have never been recorded with the county clerk, they should record them at once, as the holders cannot be considered as registered until the law has been fully complied with. All registrations expire on December 31 of each year.

CANADA

Canadian Medical Association.—At a meeting of the association, held recently in Halifax, a resolution was adopted increasing the annual fee for members, including the *Journal*, to $10. It is believed that with the increased income greater service can be rendered its members and the *Journal* can be improved.

GENERAL

Indian Research Fund.—It is reported that the Rockefeller Foundation has offered to Indian medical graduates, selected by the scientific board of the Indian Research Fund, five scholarships of $1,000 each, for the purpose of graduate public health work in America.

Medical Women's National Association.—The annual meeting of the association will be held in St. Louis, May 22-23, under the presidency of Dr. Mary Elizabeth Bass, New Orleans. Dr. L. Rosa H. Gantt, Spartansburg, S. C., is secretary-treasurer of the association.

International Congress of Ophthalmology.—The International Congress of Ophthalmology met in Washington, April 25 and 26. The congress was greeted by Vice President Coolidge. During the first session, Dr. William H. Wilmer of Washington presided. Representatives of many foreign countries attended the meetings. The following officers were elected: president, George E. de Schweinitz, Philadelphia, and secretary, Luther C. Peter, Philadelphia.

Bureau of Indian Affairs.—The National Health Council has recently issued a report on the health section of the U. S. Bureau of Indian Affairs, which describes the government health work among the Indians. This is the sixth report issued by the council and a statement concerning the division of welfare of the Postoffice Department is now in preparation. The reports already published are: Division of Vital Statistics, Bureau of the Census, Children's Bureau, and Women's Bureau Department of Labor, Division of School Hygiene, Bureau of Education, and a general report of government health activities. Copies can be obtained gratis from the office of the council, 411 Eighteenth Street, N. W., Washington, D. C

Water Pollution.—It is stated by the U. S. Public Health Service that certified water of satisfactory quality and safety may be so handled in its delivery and storage aboard a vessel as to render it unfit and unsafe for consumption. The methods used by passenger vessels operating on the Ohio and Mississippi rivers have frequently resulted in contamination of the water. On the Great Lakes, on the other hand, the methods used are satisfactory and the results of the bacteriologic analyses show much lower bacteria content. By law, drinking water on vessels engaged in interstate traffic must be obtained from certified sources ashore or must be purified by treatment aboard "by approved method." The report recommends that hydrants of the public water supply be placed on the piers at places convenient for delivery through hose. The hose so used should be carefully protected from contamination from the river water and other sources and should be used for no other purpose. When the river level is subject to marked changes, a water pipe should be run down the incline of the landing; and city hydrants, properly protected, should be placed on it at about each 15 feet of vertical rise in the landing. Preliminary steps to do this are now being taken at Louisville, Cincinnati, Evansville, Huntington, Pittsburgh and other river ports.

Bequests and Donations.—The following bequests and donations have recently been announced:

The New York Association for Improving the Condition of the Poor, $300,000, to establish a country home for nurses; Yale University, New Haven, $10,000 for a scholarship; Massachusetts General Hospital, Boston, $10,000; Saint Mary's on the Mountain, Sewanee, Tenn., $5,000, by the will of Miss Emily Howland Bourne of New York City.

The City Hospital, Akron, Ohio, the estate, valued at $101,416, of a former resident of Akron.

A children's orthopedic and a children's general hospital will be endowed at a cost of $100,000 each by the executor of the estate of John Finch of Spokane.

The Knoxville (Tenn.) Health and Welfare Association, $8,457, by general donations.

Devitt's Camp for Tuberculosis at Allenwood, Pa., $5,000; Rush Hospital for Consumption and Allied Diseases, Philadelphia, $1,000, by the will of Harry E. Schnell of Philadelphia.

Camden Hospital, Camden, S. C., $4,723, by general donations.

King's Daughters' Hospital, Brookhaven, Miss., $1,000, to complete the nurses' home, by members of the Ku Klux Klan.

Parker Convalescent Home, New Orleans, $1,000, by the will of Dr. J. D. Hunter of New Orleans.

For a new hospital in Clear Lake, Iowa, Dr. J. A. Swallum has donated a site valued at approximately $4,000. Six other physicians will give $1,000 each for the cause.

Reading Sanatorium for Treatment of Tuberculosis, Reading, Pa., $500, by the will of Mrs. Amelia Bausman.

The fund for children suffering from tuberculosis, Tampa, Fla., $205, by general donations.

LATIN AMERICA

Medical Congress in Brazil.—The Society of Medicine and Surgery of Rio de Janeiro has taken the preliminary steps for the celebration of the first national medical congress, in September, 1922, when the first centenary of Brazilian independence will be celebrated. The honorary presidents of the congress will be the president of Brazil and Dr. Catta Preta, the dean of Brazilian physicians. The congress will include five sections: public assistance, presided over by Dr. Luiz Barbosa; public health, Dr. Carlos Chagas; social medicine, Dr. Cardoso Fonte; professional practice, Dr. Ernesto Nascimento Silva, and medical teaching, Dr. Miguel Couto.

New Cuban Journal.—The medical staff of the Municipal Hospital of Havana has begun the publication of a journal entitled *Archivos del Hospital Municipal de la Habana*. In the first number, there appeared original articles by Drs. B. Souza, Ernesto R. de Aragón, G. Pedroso, G. Lequerica, A. Inclán, V. Pardo Castelló and F. D. Naranjo. The subscription price is $6 (6 pesos) a year, single copies, 50 cents. The editors are Drs. B. Sousa, Bernardo Gómez Toro, Alberto Inclán and J. M. Ramírez-Olivella. The personnel of the hospital consists of a director and assistant director, including surgeons, otorhinolaryngologists, ophthalmologists, dermatologists, obstetricians, etc.

Hospitalization in Brazil.—By the terms of Legislative Decree No. 4,428, of Dec. 28, 1921, the Brazilian congress authorized the government to establish sanatoriums for the treatment of tuberculosis, near or within the federal district, and at other points within the country, preference being given to those states in which the epidemic coefficient of tuberculosis is highest. In the extension of these sanatoriums, arrangements will be made with the state government for a division of the expenses. Each sanatorium will be provided with at least 100 beds, and a section of these will be reserved for paying patients. The decree also authorizes the government to assist, by means of loans of from 600 to 800 contos (from about $75,000 to $100,000 at the present rate of exchange), the first three private institutions of the same type and capacity, whose construction shall have been started

within one year after promulgation of this law and which are completed within two years, the maximum amount of each loan being left to the judgment of the government and determined by the number of beds in the sanatorium. To avail themselves of such aid, the institutions must be built especially for the treatment of tuberculosis, on plans conforming with the requirements of the National Department of Public Health. Guarantees must also be furnished for the repayment of the sum loaned, and an annex provided with beds, in the proportion of 10 per cent. to the total number in the sanatorium, for the treatment of government employees, who shall receive a reduction of 50 per cent. on the usual charges.

FOREIGN

Congress for Protection of Mothers.—The League to Combat Infant Mortality, an international congress for the protection of mothers and infants, will be held in Paris, July 6-8.

Diseases of the Gastro-Intestinal Tract.—The third congress on diseases of the alimentary canal was held in Hamburg, April 28-29. Cholelithiasis and the relations between disturbances of the circulatory and digestive system were the principal subjects discussed.

Royal College of Physicians of London.—At a special meeting of the college, in London, April 10, Sir Norman Moore, president, resigned after four years of service. He was succeeded by Sir Humphrey Rolleston, who was also appointed representative of the college at the celebrations in honor of the founding of the University of Padua.

German Medical Fees.—April 1, new medical rates went into effect in Germany; in the case of foreigners, the physicians must be paid in dollars. Medical advice in the consulting room during office hours costs from 10 to 200 marks; for calls at the patient's house, the fees range from 20 to 400 marks, and for night visits, 40 to 600 marks must be paid.

Mosquito Research Work.—Investigation of the habits of *Anopheles plumbeus* will be resumed by the mosquito investigation committee of the South-Eastern Union of Scientific Societies, England, which was impossible in 1921, owing to the drought in that country. Particulars can be obtained from the Rev. Oswald Hicks, Lesware, Linden Road, S. E. 15, London.

Legislative News.—A bill has been presented in the French parliament providing for the extension of the health insurance operative in Alsace-Lorraine to the rest of the country. Health and old age insurance was compulsory in Alsace-Lorraine when the province was part of the German Empire, and though now again a part of France, it retains its former insurance laws.

Antituberculosis Act.—A new antituberculosis act which makes state support available to private organizations instead of increasing the number and scope of public institutions, has recently been passed in Belgium.——A new national association of private organizations to fight tuberculosis has recently been formed, and will receive a state grant of several million francs.

Rank of University Professors.—It was recently announced by the Polish Bureau of Information in New York that university professors in Poland have equal rank with major generals, and, being state officials, are accorded all the rights and privileges enjoyed by major generals. It was reported that there are at present 638 full professors in the universities of Poland and higher academic schools.

Alcoholism in Vienna.—The medical faculty of the University of Vienna has been asked by the Bundes-Präsident to appoint a committee to draw up an appeal to the government in regard to the serious injury that is being done to the present and coming generation by the increasing alcoholism, and presenting scientific bases for the necessity of a vigorous legislative campaign against the abuse of alcohol.

Entire City a Clinic.—Sir James MacKenzie is conducting a clinic in St. Andrews, Scotland, for the entire population of the town. Every resident is being kept under strict medical supervision, examined minutely, and all symptoms noted, after which they pay monthly visits. In the case of babies, a record will be kept from birth to death, in order that physicians may note the inception, as well as the progress and cure of diseases, which they may contract.

Cremation Society of England.—At the annual meeting of the society, March 29, in London, the report was read stating that, in 1921, 1,922 cremations took place in Great Britain. It was announced that since the opening of the first crematorium at Woking, in 1885, there have been 25,418 cremations. There are sixteen crematoriums in Great Britain, fifteen in England and one in Scotland. Another is to be erected in the near future at Pontypridd, Wales. It was estimated that 1,000 ordinary burials in single graves require 1 acre of ground.

Undernourishment and Tuberculosis in Adults.—The *Zeitschrift für Tuberkulose* publishes a communication from Lubarsky of Moscow telling of the change in the form of tuberculosis observed there now in adults, discussed at a recent meeting of a local medical society. The form seems to be more like that in children; miliary tuberculosis is growing more common, and galloping consumption or a combination of bilateral pleurisy and peritonitis, and often the pleuritis is hemorrhagic. Tuberculous meningitis is also common in adults. He ascribes the modification of the form of the disease to the loss of immunity from the undernourishment.

Medical Advertising in Germany.—The committee appointed by the German Aerztebund to supervise medical advertising has published an appeal to physicians to refrain from prescribing any medicinal article, the chemical nature and pharmacologic action of which is not known from publications in medical periodicals or textbooks. The *Medizinische Klinik* says: "The committee warns expressly against proprietary medicinal articles for which exaggerated claims are made, especially those in advertisements in the lay press. No advertisements of this kind should appear in medical journals. Any inquiry about a medicinal article should be sent, with return postage, to Dr. Holste at the office of the Arzneimittelkommission of the German Internal Medicine Society at Jena." The work of this commission is somewhat along the lines of the Council on Pharmacy and Chemistry of the American Medical Association.

Sanitary Conferences in Europe.—Among the resolutions adopted at the recent sanitary conference at Warsaw, under the auspices of the League of Nations, is one that emphasizes the necessity for fighting the epidemics that threaten western Europe from the East, not only at the boundaries, but carrying the fight into the centers of the epidemics, in Ukraine and White Russia. The conference further went on record as stating that without simultaneous action to relieve the starving people, purely sanitary measures will not be of much avail. The *Deutsche medizinische Wochenschrift* gives further particulars. Drs. Frey, Otto and Mühlens were the representatives from Germany.——A conference was held also at Riga, representing the border states, including Finland and Poland. The American Red Cross and the League of Nations also had delegates here. As no representative from the soviet government appeared, no official steps could be taken. The *Klinische Wochenschrift* remarks that the fertile land of Ukraine lacks grain for seed, and war, famine, epidemics and refugee misery have made it a hotbed for epidemics.

Deaths in Other Countries

Prof. **Francis D. Boyd,** Moncrieff-Arnott, professor of clinical medicine, University of Edinburgh, Scotland, April 4.——**Sir Alfred Pearce Gould,** author of "Elements of Surgical Diagnosis," former president of the Medical Society of London and the Roentgen Society, April 19.——Dr. **J. F. Fischer,** a pioneer roentgenologist of Denmark, chief of the roentgen service of the Kommunehospital and one of the editors of the *Acta Radiologica Scandinavica,* aged 54.——Dr. **J. Martín Carro Campos,** prominent in the medical service of the Argentine navy, died at Buenos Aires recently.——Dr. **H. P. Jaeger,** assistant at the Zurich University Surgical Clinic, committed suicide at Vienna where he was serving as interchange assistant, aged 31.——Dr. **J. T. Merz,** author of "History of European Thought in the Nineteenth Century," aged 82.——Dr. **L. Riess,** formerly director of the medical department of the Friedrichshain Hospital at Berlin, aged 82.——Dr. **Weber,** chief of the Red Cross Hospital at Kassel.——The *Dermatologische Wochenschrift* mentions the death of Dr. **Marie Kaufmann,** director of the Dermatologic Clinic at Berlin.——The *Scalpel* reports the death of Dr. **H. J. Dupont,** a prominent Belgian army surgeon.

CORRECTION

Rockefeller Foundation Not Providing Physicians for Rural Service.—Referring to an item published, February 25, relative to a plan for stimulating settlement in rural communities by physicians, the Rockefeller Foundation states that

it has not agreed to subsidize medical practice in rural communities, and that while it is interested in the question of medical service for rural districts, it has not undertaken any direct cooperation in providing such service.

Government Services

Government Homes to Receive Disabled Rejected Draftees

National homes for disabled volunteer soldiers have been authorized to receive as patients of the U. S. Veterans' Bureau a certain class of ex-service men who, during the draft, were accepted by local boards and later rejected at the training camps for physical defects. These men are eligible to entrance into these homes only when they can prove that they are in needy circumstances.

Statistics on Disabled Veterans

According to the report of the director of the U. S. Veterans' Bureau, there are at present 30,879 disabled ex-service men and women receiving hospital care and treatment under the U. S. Veterans' Bureau in hospitals and institutions throughout the country. These men, the report says, are still suffering from wounds, injuries or shock of battle or illness while in the service, almost four years after the close of the war. There are at present 12,274 tuberculous ex-service men and women hospitalized in the various institutions under contract or directly operated by the U. S. Veterans' Bureau. There are also 9,069 neuropsychiatric cases, in many of which the patients are suffering from war neurosis, and 9,536 ex-service men who are hospitalized and whose cases are classified as general medical and surgical.

New Legislation for Care of Disabled

Disabled ex-service men, members of the Army and Navy nurses' corps and their dependents, are entitled to compensation and hospital treatment regardless of whether their disabilities were incurred while in actual service during the World War, provided they are suffering with certain diseases, according to an amendment to the War Risk Insurance Act, introduced in Congress by Senator Calder of New York. The diseases named in the measure include neurosis or psychoneurosis, active tuberculosis and chronic empyema. In all cases in which former service men and women develop any of these diseases within three years after their separation from the service, they will be entitled to compensation. The Calder bill also fixes the rate of total permanent disability at $100 per month and double total permanent disability at $200 per month. The measure was referred to the Senate Committee on Finance.

Campaign for Insurance

The U. S. Veterans' Bureau of the fifth district in South Carolina conducted an insurance campaign week, April 10-17, for the purpose of reinstating and converting the term insurance of ex-service men. The required examinations for reinstating the term insurance will be given by any authorized salaried physician of the U. S. Veterans' Bureau or the U. S. Public Health Service. Applicants for reinstatement of insurance will not be required to pass a physical examination if the date of lapsing is less than three months from the date of reinstatement. Disabled men will be required to pass physical examination and pay all back premiums with 5 per cent. interest compounded annually from date of lapsing. Men not disabled will be required to pass physical examination after three months' time from date of lapsing, but will only be required to pay two monthly premiums, one at the rate in force when the insurance lapsed and one at the rate of reinstatement.

U. S. Public Health Service to Hold Examinations

Examinations of candidates for entrance into the regular corps of the U. S. Public Health Service will be held at Washington, D. C., May 15 and June 12, and in San Francisco, June 12. Candidates must not be less than 23 nor more than 32 years of age. They must pass oral, written and clinical tests before a board of medical officers.

Foreign Letters

PARIS

(From Our Regular Correspondent)

April 14, 1922.

The European Health Conference

The questions discussed at the European health conference held recently at Warsaw, at which France was represented by Dr. Cruveilhier, and Dr. Baron, army physician with the French military mission at Warsaw, did not attract as much attention as the Genoa conference. Nevertheless, they were of the highest importance, since they dealt with the means of warding off epidemics, now threatening the whole of Europe. The condition in which Russia found herself during and after the World War favored the development of deadly epidemics, especially of typhus, recurrent fever, cholera, typhoid and dysentery. Before the war, the morbidity in Russia from exanthematous typhus was about 90,000 yearly, and from recurrent fever, 30,000. In 1920, the official number of typhus cases reached 3,000,000 and the cases of recurrent fever, 1,000,000. There was a proportionate increase noted in Poland and in other eastern countries. Notwithstanding the economic and social difficulties, these countries organized and applied a system of control and prevention, which resulted in some improvement during the first nine months of 1921. In Russia, the number of typhus cases dropped from 3,000,000 to 600,000; in Poland, from 157,000 to 48,000, and in Roumania, from 45,855 to 4,834. But, unfortunately, toward the end of 1921, the period of famine, which caused a considerable migration, first from province to province and then from country to country, caused a sudden and violent recrudescence of typhus and recurrent fever accompanied by cholera. In the European migration of great masses of people westward from the contaminated regions of the Volga and Ukraine, and from the coast of the Black Sea, lies a serious menace to the rest of Europe. Unfavorable conditions prompting migration from regions attacked by famine, and by the epidemics which generally follow, are increasing daily and becoming more and more threatening.

Thus, the conference is convinced that it is necessary to increase our efforts without delay if we wish to prevent the present epidemic conditions from causing more suffering and deaths among the people of the affected regions, from hindering reconstruction and commerce, and from spreading to the whole continent of Europe. The conference emphasized the fact that the present difficulties are enhanced by the lack of physicians and of competent personnel, and that this is due partly to the havoc played by disease and death in the ranks of those who devoted their lives to this campaign against death. Thus, in the presence of the necessity of reenforcing the medical and health personnel in order to combat epidemics in eastern Europe, and in view of the fact that such a fight can be successful only with the assistance of the health services of the countries interested, the conference, on the suggestion of Dr. A. Castellani, professor of the school of tropical medicine of London and delegate from Italy, recommended that courses of instruction for all ranks of the medical and health personnel be organized in two or three centers, as for example, Warsaw, Kharkof and Moscow. Experts chosen from the public hygiene service of all nations should be invited to cooperate with the instructing personnel. Permanent expositions showing all the apparatus needed in the fight against infectious diseases, and the means employed to combat them, should be organized in these centers. The conference believes that the reconstruction of Russia will not only be hindered as long as epidemics con-

tinue to rage but that the threatening extension of the epidemics to neighboring countries is a formidable obstacle to their reconstruction. Besides typhus and recurrent fever an epidemic of cholera is developing rapidly in Ukraine and in Russia, and the economic reconstruction of these countries should not be undertaken until sanitary conditions have been restored to normal. The ever present danger of these diseases would undoubtedly hamper all commercial undertakings and would paralyze any economic activities.

While the conference appreciates to its full value the work accomplished by the soviet authorities, it was, however, deeply concerned over the extent of suffering and the mortality in Russia. These considerations induced the conference to devise a plan of campaign combining its defensive efforts against epidemics on the frontiers with a direct attack on the focus of diseases in the interior of Russia. On the suggestion of Professor Otto, German delegate, the conference adopted a resolution concerning the necessity for completing measures of hygiene to be taken in Russia and in Ukraine, and for fighting famine, one of the principal causes of epidemics. All nations are invited to participate in this campaign, without which an efficient fight against disease is impossible. The conference, in consideration of the fact that sanitary conditions in Europe are extremely grave, agreed that the fight against epidemics could not be successfully carried on by the interested countries only, and all European governments agreed to participate actively. Nations combating the epidemics in their own territory with their own means will deduct from their dues an amount equal to the sums spent for the purpose. Contributions can be made in money, material or personnel. The execution of resolutions adopted by the European Health Conference of Warsaw is entrusted to the hygiene department of the League of Nations. If one of the European countries should lend its assistance to any of the interested countries, either in money or in any other form, through the Epidemic Commission of the League of Nations, the use of such funds or of material given will be entrusted to the commission. Finally, the commission emphasized the necessity, for the countries that do not belong to the League of Nations, of being represented in this organization.

Appendicitis and Mumps

Mumps, as we know, have a predilection for lymphoid tissue. All lymphoid organs are susceptible to reaction during the infection, and the tonsils, the spleen, the various ganglion groups and the lymphatic formations of the intestine often manifest injury during the disease by symptoms which, when grouped, take on clinical importance. Tonsillitis, and splenic and typhoid forms of mumps have already been described. In the last number of the *Toulouse médical*, Prof. G. Serr studies the relations of appendicular manifestations and mumps. On account of its anatomic and histologic constitution, and because of the intestinal inflammatory symptoms which often accompany parotid congestion, the appendix should naturally show acute and frequent reaction in mumps. However, the majority of studies on mumps do not even mention this complication; several works on appendicitis and its manifestations in infectious diseases do not speak of it, and few consider it of sufficient importance to make mention of it in an enumeration of the usual complications. In fact, instances of appendicitis complicating mumps seem scarce and not well determined, which is surprising, considering the diffusion of mumps. But if a well marked appendicitis is a rare complication of mumps, appendicular reactions, slight or even latent, disclosed only after careful examination, are more frequently encountered. There exists an obscure appendicular reaction, discovered only after careful examination, as well as a mumps meningitis which more frequently than not is symptomless and which only lumbar puncture can reveal. Serr made a systematic research on appendicular manifestations in 177 patients with mumps whom he observed during the war. Only once did he encounter a case of unquestionable appendicitis with perforation, which necessitated immediate intervention, thus giving proof of the correctness of the diagnosis. Such grave cases are exceptional in mumps. More often appendicular crises presenting Talamon's appendicular colic are encountered; but slight appendicular manifestations are far more frequent. The clinical picture is constituted by the symptoms of both affections. This association does not give a special character to the symptomatology. It is more or less distinguished by the intensity of the appendicular manifestation and also by the period during which the complication appears. Slight appendicular manifestations which appear during mumps do not attract attention; they must be looked for. They are not accompanied by special disturbance of the general condition. Fever may not increase, and there are no chills nor peritoneal reaction. In certain cases, there is neither vomiting nor nausea. On deep palpation of the abdominal wall, no swelling nor puffiness is felt and only a localized sensitiveness is found at McBurney's point. The patient does not complain of spontaneous pains in the right iliac fossa. Sometimes a slight pressure on the abdomen is enough to cause pain. This pain persists for a few days with the same fixity and sharpness and then decreases and disappears. We must also take into account cases in which appendicitis manifests itself after the disappearance of the symptoms of mumps. In any case, it is important to watch carefully all patients who have presented signs of appendicitis during the course of mumps. They are predisposed later to attacks of appendicitis from ordinary causes.

Creation of a Central Medical Headquarters

Under the presidency of Professor Roger, dean of the school of medicine of the University of Paris, a conference, proposed by the Association générale des médecins de France, was held a few days ago at the school of medicine. Delegates from the various medical societies in and around Paris assisted at the session. Dr. Levassort, general secretary of the association, expressed the hope that medical headquarters would be established in Paris similar to those which are in existence in most of the capitals and large cities in foreign countries. This house would be a meeting place and an information center for the majority of learned societies, and would give all the assistance possible to physicians coming to Paris from the various parts of France and from foreign countries. These propositions were favorably received and the Association générale des médecins de France has already secured the help of the city of Paris for their realization.

LONDON

(From Our Regular Correspondent)

London, April 10, 1922.

Sir Patrick Manson

Sir Patrick Manson, G.C.M.G., M.D., LL.D., F.R.S., has died in London. Born in Aberdeenshire in 1844, he was educated at the University of Aberdeen, where he graduated in 1865. The following year, he began practice in the East, first in Formosa, and then in Amoy and Hong Kong. In the latter city, he was one of the founders of a college of medicine for the Chinese. When he began to practice, tropical medicine was so rudimentary that he found himself ignorant of many of the diseases with which he was confronted and books gave him little assistance. He immediately set to work to fill the gaps. His first great research was done on elephantiasis. During a visit to London in 1874, he heard of the discovery made by Lewis in 1872 that in the blood of the inhabitants of certain parts of India could be found a worm, which he called

Filaria sanguinis-hominis. In some cases, Lewis found the parasite associated with elephantiasis.

On investigation after his return to China, Manson found the filaria present, in certain districts, in 50 per cent. of the population while in others he was unable to find it at all. Using that "scientific imagination" which is necessary for great discoveries, he inferred that since the parasite showed no sign of growth in the blood or capacity for reproduction, it was in an immature form. After much work, he found that this was true; but the discovery had been anticipated by two great pioneers of medical helminthology, Bancroft and Lewis. The problem remaining was, How did the parasite gain access to the body? Manson argued that, as it was never found in any of the natural discharges, it could not escape spontaneously and so be carried from man to man, without the aid of a vector capable of penetrating the skin and imbibing the blood. The most likely one seemed to him to be the mosquito. To determine the frequency with which the filaria was present in the blood, he, with the aid of two Chinese medical students whom he trained for the purpose, examined the blood of 1,000 natives. One assistant worked by day, the other by night. The former seldom found a filaria; the latter, many. This led to the discovery that the parasites appeared in the blood about sunset and gradually decreased toward morning. The periodicity suggested adaptation to the nocturnal habits of the mosquito. Manson found that the filaria was imbibed with the blood and flourished in the digestive juices of the mosquito. He traced the parasite through the stomach wall into the abdominal cavity and thence into the thoracic muscles and the proboscis, where it was ready to infect man on biting. During this passage, it developed a mouth, alimentary canal and sexual organs, and grew enormously. He conjectured that when the mosquito died the filaria escaped into water and thus reached the human body. By systematic examination of the blood of the natives of many tropical countries, he discovered three other species of filariae.

His next stroke of genius was the extension of the knowledge so gained to malaria. The hypothesis of an insect-borne origin was not new, but it was only a surmise which was never accepted and had been forgotten when Laveran, in 1880, discovered the plasmodium of malaria. In 1894, Manson pointed out how closely parallel were the conditions of its evolution to those of the filaria. He reasoned that, as it also was incapable of leaving the body spontaneously, being enclosed in a red corpuscle, some blood-sucking animal must be the agent of transmission. He had not the opportunity of testing this hypothesis, but he inspired Ross to do so. He even suggested that, failing human subjects, Ross should work out the life history of the corresponding parasites in birds. This Ross did and from this basis established the mosquito-borne origin of malaria. This in turn led to discovery of the similar origin of other tropical diseases—yellow fever, tick fever, trypanosomiasis and to the development of almost the whole science of tropical hygiene.

Manson returned to England, and, in 1895, was appointed to the first lectureship on tropical medicine in London, which was established at St. George's Hospital. He became medical adviser to the Colonial Office and was thus enabled to impress on the government the importance of medicine in colonization. Mainly through his influence, the London School of Tropical Medicine was opened in 1899. This was a model for schools which were founded in other countries. Manson was not only a great discoverer but an inspiring teacher and a lucid writer and systematizer. He stated that 99 per cent. of tropical diseases are caused by germs which in their extracorporeal stage are very vulnerable. He conjectured that the mode of conveyance by insect vectors applied to many protozoal germs, the life history of which had not been worked out. Of his many and important publications, it is necessary to mention only his textbook "Tropical Diseases," which went through many editions and was translated into the French. It may be scarcely fair to the pioneers of tropical medicine, who mostly belonged to the Indian Medical Service, to call him, as has been done, "the father of tropical medicine," but he was certainly the father of tropical entomology and hygiene.

A Congress of Radiology and Physiotherapy

It was intended to hold a congress of radiology and physiotherapy in London in 1921, but, owing to the railway strike, the meeting was postponed. It will be held June 7-10. It has been arranged by the Section of Electro-Therapeutics of the Royal Society of Medicine and the British Association for the Advancement of Radiology and Physiotherapy. There will be three sections—radiology, physiotherapy and electrology. Dr. Thurstan Holland of Liverpool is president of the first section. The first day will be devoted to study of the stomach. The morning discussion will concern the normal stomach and will be opened by Dr. Barclay of Manchester, Dr. Peremans of Antwerp and Drs. Colombier and Tribout of Paris. The afternoon discussion, on the abnormal stomach, will be opened by Dr. Béclère of Paris, Dr. Murdoch of Brussels and Sir Archibald Reid. The other subject for this section is deep therapy by roentgen rays and radium. It will be opened by Dr. Ledoux-Lebard of Paris, and Madame Laborde, Dr. Casman of Antwerp, Mr. Hayward Pinch, director of the Radium Institute, and Dr. Robert Knox.

Demonstrations will be given in various hospitals, including one on intraperitoneal injection of oxygen, at St. Bartholomew's Hospital. The section on electrology will be under the presidency of Dr. E. P. Cumberbatch. The subject of the action of the direct (constant) current on the tissues beneath the skin and mucous membrane will be introduced by Dr. Turrell of Oxford. Discussion of electrical methods in the diagnosis and prognosis of paralysis will be opened by Dr. R. Woods of London and Dr. Bourguignon of Paris. Other subjects are: the action and uses of high frequency currents, the physiotherapy of cardiac disorders, and reeducation of muscles in scoliosis, backache and referred pain. Applications for membership in the congress should be addressed to Dr. James Metcalf, 123 Harley Street, London. The subscription is $10.

BUCHAREST

(From Our Regular Correspondent)

April 2, 1922.

Occurrence of Several Cases of Pseudorabies

Dr. Levesinsky, medical officer in Zagreb, Jugoslavia, reports a terrible outbreak of rabies recently, there being no less than twenty persons reported to be suffering from hydrophobia. Among the number is a man who was bitten by a child 8 years of age, who had himself contracted the disease from the bite of a schoolfellow. No mention is made of mad dogs, and, on investigation of the circumstances, it becomes evident that although the alleged outbreak owed its origin to one, or possibly, two genuine cases of hydrophobia, the other cases are, in all probability, of the nature of imitative hysteria or, as Dr. Levesinsky calls it, "hydrophobia by suggestion," this name having been given to a similar outbreak of rabies in Madrid in 1902. The cases were of benign character. It was once believed, and indeed the belief is still very generally entertained by the nonmedical, that fear may per se engender hydrophobia, and instances have been placed on record in which pseudohydrophobia actually proved fatal. It is obvious that the supervention of grave symptoms in such cases must be due to complications; as, for instance, to meningitis or other acute cerebral disease. Morbid scare is epidemic in its incidence; and, in the presence of a hydrophobic scare, many persons of unstable nervous equilibrium

forthwith develop symptoms which pass for hydrophobia, just as every rise of temperature and every malaise is ascribed to influenza when the prevalence of that disease concerns the minds of men. Now hydrophobia is usually considered an inevitably fatal disease, so that the fact of recovery belies the diagnosis. The mental excitement, writes Levesinsky, as well as the physical depression, which in certain subjects follows the bite of a dog, are eminently calculated to fan into activity any latent meingeal or cerebral weakness. At the same time, an error of diagnosis ought not to be possible in regard to the merely hysterical phenomena.

A Rare Case of Hellebore Poisoning

A good deal of scientific interest is attached to the death of an old peasant named Ibrahim Jussuf of Sarajevo, capital of Bosnia. An inquest was held February 22 by the city coroner and resulted in a verdict of accidental death through poisoning by hellebore. The victim suffered from pains in the stomach and went to his room to take some liquorice powder. Half an hour later he returned, saying that he had taken hellebore by mistake, for liquorice powder. He was taken by his wife to a chemist, whose shop he reached within half an hour. He was advised to go to the ambulance, and walked away looking as if nothing were the matter with him. Shortly afterward he was found in a helpless condition in the road and was taken to the country hospital, where, after violent pain and convulsions he died, in a quarter of an hour, before the stomach tube could be employed. Last December, Jussuf bought the hellebore at a chemist's, for the purpose of making an ointment to allay an irritation of the skin, proved after death to be scabies. The hellebore, liquorice powder and Carlsbad salt were kept on the top of the wardrobe. The deceased man's wife said that they used hellebore in summer in the garden, and for vermifuge.

The Resistance of Bacteria Against Cold

In an address given before the medical society of Bucharest, Dr. D. Lascu, public health officer, said that it had long been held that exposure to prolonged cold is fatal to most pathogenic bacteria, and in particular to the typhoid bacillus. While it was known that short exposure even to intense cold, such as that of liquid air, was insufficient to do more than inhibit their growth, yet many observations had gone to show that when bacteria were exposed for days or weeks to a temperature below freezing point, they died. In an exhaustive examination of the ice supply of Bucharest, this view was borne out, and the investigators came to the conclusion that ice more than three weeks old was sanitarily as safe as well filtered water. Some recent epidemics have, however, shown facts startlingly at variance with the accepted views, and of great importance to public health, particularly in southern countries, where the consumption of ice is much greater than in northern countries. In an epidemic which occurred some years ago at Yessy, the outbreak started with the consumption of ice from an icehouse in which it had been stored for eight months. The water supply and food were above suspicion, and the ice was made the chief object of investigation. Simple culture experiments were sufficient to establish the presence of both typhoid and colon bacilli, showing unquestionably the presence of sewage contamination. Further inquiry elicited the fact that at the time the ice was forming the previous winter there had been a few cases of typhoid in the vicinity. These seems no reason to doubt, then, that typhoid bacillus has the power of resisting low temperature for many months.

Psychoses Associated with Migraine

Dr. Manoilescu, in a paper on psychoses associated with migraine, says that simple hemicrania sometimes develops mental irritation or depression, anger, or slight hallucinations, with migraine of an epileptic type, and muscular twitching; or, ocular manifestations, such as a visual aura, can precede an attack of migraine. The true epileptic nature of the migraine is noted when the visual aura becomes red. Abortive attacks may occur in both, or one is substituted for the other. Psychical symptoms or a psychical equivalent may occur in either. A transitory psychosis sometimes follows or accompanies migraine. This is important from a therapeutic standpoint, indicating the necessity of an anti-epileptic treatment for migraine. In the same way, the writer notes close clinical relation between attacks of migraine and hysteria major. Several types of cases are on record; (1) a combination of hallucinations of sight, confusion, amnesia or ataxia, and aphasia, with attacks of migraine lasting six hours; (2) confusion, with religious delirium; (3) hemicrania, with temporary blindness, paresthesia and a speech disturbance; (4) hemicrania after mental shock, with anxious delirium, and disturbance of consciousness for three days. The occurrence of these psychoses is, however, rare.

BUDAPEST

(From Our Regular Correspondent)

April 12, 1922.

The Housing of Working Men

The project of providing suitable and hygienic dwellings for agricultural laborers in Hungary has been realized during the last two years through government grants, a certain sum having been included for that purpose in each year's budget. The action was originally begun in 1901. The annual expenditure, from 1901 to 1905, amounted to $15,000; but the demand for cottages increased to such an extent that, in 1906, the annual grant was increased to $25,000. As this amount also proved inadequate, an act was passed in the following year which authorized the conversion of the $85,000 of capital into interest, thus making it possible to build about 1,500 cottages every year. Another clause of the same act provided that, in case land was sold to laborers for building purposes by the local authorities, all the necessary plans, surveys and contracts were to be made by the minister of agriculture at the expense of the state. The interests of the laboring classes are safeguarded by the act in a variety of other ways. For instance, the land selected for building purposes must be entirely suitable as regards soil, air and drinking water; any attempt at speculation on the part of the builder or contractor is strictly forbidden; while the conditions of the sale or loan, the terms of the loan, and the general plan must be acceptable to the laborer. During the period allowed for his repayment of the loan, the property can neither be seized for debt, nor divided, encumbered, or alienated in any way. A complete exemption from taxation is granted for twenty years. With regard to the selection of sites, preference is given to applications coming from such parishes and local authorities as make a free grant either of land on which to build the house or of ground suitable for gardens. The necessary materials are forwarded at cost price on all the railways owned or worked by the government, but state assistance is only granted for buildings designed to accommodate one family. Each cottage occupies a plot of ground covering from 1,000 to 1,200 square yards (836 to 1,003 square meters); and the cost of building varies from 80,000 to 100,000 crowns ($160 to $200). Loans made to laborers who wish to build a house may be repaid by annual instalments of sums ranging from 5 to 6,000 crowns, extending over a period of from twenty to thirty years. Under the provisions of the Act of 1907, 10,943 workmen's cottages were built, in 1913, in different parts of Hungary; whereas, in 1920, only 147 and, in 1921, only 281 cottages were built. An important result of this act has been the abolishment of land speculation, and the

keeping down of prices of building sites, owing to the fact that most townships in Hungary own the adjacent country, which, formerly used as common land to supply fuel and pasturage to the townsfolk, now offers a convenient site for the erection of workmen's dwellings. But the care of the state is not confined to the housing of agricultural laborers alone. A law was passed, July 20, 1908, which authorized the construction of houses in Budapest for employees of both state and private enterprises, the government undertaking the building of the houses, and $25,000,000 having been set aside for that purpose.

The actual building was commenced in 1909; and by May 1, 1911, 270 houses, containing in all 970 flats, had been finished; and 722, containing in all 970 flats, were planned for erection in the course of 1914. However, the war, which broke out in July, prevented the carrying out of this plan. It should be added that the government continues its housing policy even now; however, in consideration of the exorbitant prices prevailing, the work is being continued only on a very much smaller scale, although the need for tenements was never so urgent as now.

Tuberculosis in the Tisza Regions

The high rate of mortality from tuberculosis in some regions near the Tisza River, and particularly on the so-called lowland, ascribed by some authorities to a peculiar susceptibility on the part of those of pure Hungarian blood, who usually inhabit the plains, has been made the subject of close study by Dr. Okolicsaniji. Kuthy Dezso, it is interesting to note, is convinced that the terrible prevalence of phthisis among Hungarians or ancient Magyars, as they are usually called, is due to climatic rather than to hereditary causes. He points out that the lowlands of Hungary have a climate that possesses every feature liable to foster the spread of the disease, including extremes of heat and cold, and very dry summers, when the vast quantities of dust cannot fail to work havoc with the lungs of the inhabitants. Such a state of affairs, according to Dr. Okolicsaniji can be remedied only by educating the people with regard to their houses and clothing and by planting trees, a measure which would serve a double purpose of improving the climate and lessening the amount of dust.

PRAGUE

(From Our Regular Correspondent)

April 4, 1922.

Book on Public Health Service

The chief health officer of the city of Prague, Dr. Ladislav Procházka, former minister of health of Czechoslovakia, has just issued a book, "The Public Health Service of Greater Prague," which summarizes his suggestions for the reorganization of the health service of Greater Prague, recently accomplished through the combination of a number of communities adjoining the old city. The law for the nationalization of all health services in the republic, prepared by Doctor Procházka during his service in the ministry of health, recently placed before the parliament, exempts the city of Prague. Doctor Procházka suggests that the health services of Greater Prague also be nationalized; he believes that if the health officers are not paid locally they will be able to develop much more initiative and that they will be much more independent than if they were dependent for their salaries on local authorities. He wishes to have the health services concentrated in a central office, which already exists. He desires to have the city divided into wards and the wards combined into districts. Each ward would have a part-time health officer, who would at the same time be in charge of a preventive health center, which should be erected in every ward. The districts would be in charge of full-time health officers. The cost of the service would be met by the state; whereas investments for buildings, etc., would be paid out of local funds. He would like to have the health officers vested with more executive power. Under the law in the old Austria the executive power rested with lawyers and the health officers served in a more or less advisory capacity. He proposes to make the health officer the executive officer of a regular board of health, in accordance with the custom in Anglo-Saxon countries.

The second part of the book is a descriptive public health survey of Greater Prague, including all communities which now have become a part of the Prague territory. On the whole, the public health situation does not seem very satisfactory. This is especially so in the new communities, where often truly rural conditions exist. The book is the second publication of this kind on the public health situation in Prague to appear since the end of the war. The first was published by Philip S. Platt of the American Red Cross, who has made a health survey as a part of a complete social survey of the city of Prague, which has been carried out by workers of the Y. M. C. A. It is interesting to observe, in a book on the same topic published two years later by a leader of the public health movement in Czechoslovakia, how far the ideas which have been brought here by foreign workers have implanted themselves in the local soil or have been adapted to the prevailing local conditions.

Child Welfare Clinics

Dr. H. O. Eversole, who is directing the child welfare program of the American Red Cross for Czechoslovakia, has published a chart summarizing the work of the twenty-one child welfare clinics which he has established all over the republic. Three of the centers are operating in Prague, twenty-two in the province of Bohemia, five in Moravia, two in Slovakia and two in Ruthenia. The first of the clinics was opened in June of last year. The centers have been established by the American Red Cross, in cooperation with the ministries of health and social welfare and with the voluntary child welfare organizations. A local physician is in charge of every clinic. The figures published in the chart visualized the enormous amount of good which the Czechoslovak children have derived from these centers, 58,810 children having been examined in the clinics in the course of the eight months ending February, 1922. One of the most important parts of the work, if indeed it is not the most important, is the public health education which is being carried out in the centers among the attending children as well as among their families. There is no doubt that this important contribution to the health work of the republic will be taken over by local authorities when the American Red Cross ceases to run it.

BERLIN

(From Our Regular Correspondent)

April 8, 1922.

Danger of an Invasion by Typhus Fever

In the *Deutsche medizinische Wochenschrift* **48**:428 (March 31) 1922, Dr. Omankowski, chief of the emigration camp in Danzig, calls attention to the danger that threatens from an invasion of western Europe and the countries beyond by the typhus fever that is now raging in Russia and Poland. As the question is of importance in connection with emigration to America, I will describe the conditions as they exist. Omankowski rightly emphasizes the fact that the sanitation centers that were established on the eastern border before the war, which made the invasion of Germany by infectious diseases almost impossible, have now been abandoned, and that the defective hygienic conditions that prevail in Poland

are by no means adequate to meet the needs as regards the prompt disinfection of fugitives from Russia and the Balkan states, who are so generally infested with lice and are the carriers of typhus fever. The Netherlands, France and Belgium have established sanitation centers at embarkation ports, but at present there are no such centers in operation along the border between Poland and Germany. In Danzig alone, which unfortunately is likewise separated from Germany, an emigration camp has been established; this sanitation center will lessen the danger somewhat, provided the stream of emigration from the East passes through this camp. That the danger for us in Germany is not merely a matter of future speculation is shown by the fact that in Frankfort-on-the-Oder, which is only a short distance from the gates of Berlin, almost 200 typhus fever cases were found among the fugitives who emigrated from the Volga region to Germany and lands beyond. Concerning the danger that threatens from eastern Europe by reason of the typhus fever and also the cholera, an official report contains the following items: In soviet Russia and in Ukraine, there were approximately twenty million typhus fever cases during 1919 and 1920. In 1921, in soviet Russia alone, 1,290,000 cases of typhus and recurrent fever were officially reported. The number of actual cases is, however, estimated at from six to seven millions. Last summer an abatement in these diseases was noted, but with the coming of September there was an increased incidence in all parts of Russia, brought about by the movement of large bodies of the population in consequence of the famine. Especially in Petrograd and Moscow, an epidemic of typhus fever appeared. Also the army of the Reds suffered greatly from typhus and recurrent fevers. Most of the fugitives, among them, many returning Polish wanderers, were deflected toward the western governments of Russia (Vitebsk, Pskof, Smolensk, Minsk and Homel) and the eastern regions of Poland (Novogrudok, Pinsk, Kowal and Grodno). In January, at least 120,000 fugitives had gathered in the Russian border towns (Minsk, Zhitomir, Koretz and Zhepetovka), with the intention of crossing the frontier. Of this number, only a small portion were disinfected. However, from March to December, 1921, 301,287 returning fugitives passed through quarantine at Baranovichi. Their condition of health was extremely bad. Of 50,981 fugitives that were quarantined at Baranovichi in October, 804 were in need of hospital treatment and 497 deaths occurred. In November, of 59,843 newly arrived fugitives, 1,227 were hospitalized and 1,406 deaths are recorded. In the quarantine camp, in spite of all precautions, typhus fever developed among the nursing personnel. Of 400 nurses and employees, 114 were ill with typhus at once. In numerous instances the returning fugitives broke through the cordon of quarantine stations, crossed the so-called "green border," and carried typhus and recurrent fevers into Poland. The regions about Novogrudok, Vilna, Brest-Litovsk and Volhynia were severely affected. In Warsaw there is at present an epidemic of typhus fever, and even in Bromberg a focus of typhus is reported. Serious as the condition of affairs has been of late, it is feared that the greatest difficulties will be encountered when the famine has reached its climax. As for cholera, this disease was brought by fugitives from soviet Russia to Ukraine in the autumn of 1921. At present, the disease is found in numerous towns and villages throughout Ukraine. During the last three months of 1921, cholera cases were reported every day in Kharkof, and in Kief, between the middle of December, 1921, and Jan. 11, 1922, 239 cases developed. It is feared that large numbers of the population of Ukraine, as a consequence of the famine which has begun to affect this country as well, will before long move westward, and that the danger of cholera spreading throughout Europe will be thereby enhanced.

Marriages

JOHN MERRIL MONTFORT, Atlanta, Ga., to Miss Virginia Neville Taylor of Tacoma, Wash., at Chevy Chase, Md., recently.

JOHN LINN GOOD, New Cumberland, Pa., to Miss Margaret Rogers Attick of Steelton, Pa., April 15.

DELANO RICHARD AVES, Hearne, Texas, to Miss Laura Marion Mason of Milwaukee, April 24.

JOHN F. SOUTHWELL to Miss Beulah A. Stafford, both of Albany, N. Y., recently.

Deaths

Charles Norton Barney, M. C., U. S. Navy, retired ⊕ Denver; Medical School of Harvard University, Boston, 1895; served as a first lieutenant and surgeon, Spanish-American War, and later as a surgeon in the Navy; commissioned to the regular army in 1901 as assistant surgeon with the rank of first lieutenant; retired, December, 1920; died suddenly, April 6, aged 49.

Willis Gaylord Tucker, Albany, N. Y.; Albany Medical College, Albany, 1870; member of the Medical Society of the State of New York; formerly professor of chemistry and toxicology, and dean of the Albany Medical College and the Albany College of Pharmacy; chief chemist of the state health department; died, April 22, aged 72, from pneumonia.

Gardner Hirons ⊕ New York City; Medical College of Ohio, Cincinnati, 1882; member of the New York Academy of Medicine and the New York Obstetrical Society; visiting physician to the Woman's Hospital in the State of New York, New York City; died, April 20, aged 61, from chronic nephritis.

Robert Eaton Weeks ⊕ Los Angeles; Detroit College of Medicine, Detroit, 1904; also a pharmacist; served in Germany and France as lieutenant, M. C., U. S. Army, during the World War; city physician of the Los Angeles Health Department; died, April 9, aged 41, from cerebral hemorrhage.

Harry Luther Smith ⊕ Washington, D. C.; University of Pennsylvania School of Medicine, Philadelphia, 1906; lieutenant-commander, M. C., U. S. Navy; member of the Medical Society of Virginia; died, April 14, aged 38, at the U. S. Naval Hospital, Chelsea, Mass., from appendicitis.

George Elright Thompson, Dodge City, Kan.; St. Louis University School of Medicine, St. Louis, 1921; served in the M. C., U. S. Army, during the World War; died recently, aged 30, at the Thompson and Pine Hospital, following an operation for appendicitis.

Charles U. Gravatt ⊕ Port Royal, Va.; College of Physicians and Surgeons, Baltimore, 1870; medical director, captain, M. C., U. S. Navy; served as state senator for eight years; formerly a surgeon in the Navy; died, April 14, aged 72.

George B. Malone, Memphis, Tenn.; Washington University School of Medicine, Baltimore, 1872; formerly president of the board of education; Confederate veteran; died, April 13, at St. Joseph's Hospital, aged 77, from cerebral hemorrhage.

Harry Grimmett Hunter, Hendersonville, N. C.; University of Pennsylvania School of Medicine, Philadelphia, 1921; was serving his internship at the Presbyterian Hospital, Philadelphia, when he died, April 8, aged 25, from influenza.

Walter Dwight Merritt, Enumclaw, Wash.; Rush Medical College, Chicago, 1902; member of the Washington State Medical Association; was killed, April 20, when the automobile in which he was riding overturned, aged 44.

Thomas Gilmore Robert, Davenport, Iowa; Homeopathic Medical College of Missouri, St. Louis, 1877; formerly professor of pediatrics and clinical diseases of children, Hering Medical College, Chicago, died recently, aged 71.

Dallas K. Jones, Wooster, Ohio; Medical Department of the University of Wooster, Cleveland, 1885; member of the

⊕ Indicates "Fellow" of the American Medical Association.

Ohio State Medical Association; health commissioner of Wayne County; died, April 5, aged 61.

Monroe M. Robbins, Hickory, Wis.; Bellevue Hospital Medical College, New York City, 1865; surgeon in the Civil War; at one time health officer, U. S. Pension Examining Board; died, March 31, aged 80.

Agnes M. Sparks, Brooklyn; Medical Department, University of California, San Francisco, 1879; member of the Medical Society of the State of New York; died, April 16, aged 69, at the Norwegian Hospital.

Frank Newhall Patterson ✠ New York City; Medical Department of the University of the City of New York, 1886; member of the New York Academy of Medicine; died, April 16, aged 61, from myocarditis.

Eugene Otto Christoph ✠ Chicago; University of Freiburg, Germany, 1887; formerly gynecologist to the Provident Hospital and Training School Association; died, April 19, aged 60, from chronic nephritis.

James Paul, Jersey City, N. J.; University of Glasgow, Scotland, 1869; formerly surgeon on steamships plying between Scotland and United States; died, February 23, aged 78, from pneumonia.

Edward Monroe Fly ✠ National City, Calif.; Jefferson Medical College, Philadelphia, 1894; formerly local surgeon for the Santa Fe Railroad; died, April 14, aged 55, at the Elwyn Sanitarium.

Henry M. Ochiltree, Haddam, Kan.; College of Physicians and Surgeons, Keokuk, Iowa, 1872; also a pharmacist; member of the Kansas Medical Society; died, February 24, aged 73, from influenza.

Walter Graham Murphy ✠ Hartford, Conn.; Albany Medical College, Albany, N. Y., 1890; served with the rank of captain, M. C., U. S. Army, during the World War; died, April 17, aged 53.

Robert G. Black, Vancouver, Wash.; College of Physicians and Surgeons, Baltimore, 1886; formerly county and city health officer; at one time coroner of Clarke County; died, April 16, aged 58.

Harold Albert Fiske ✠ Pasadena, Calif.; University of Vermont College of Medicine, Burlington, Vt., 1895; served as major during the World War; died, April 18, aged 48, from pleuropneumonia.

Charles H. McLane, Morgantown, W. Va.; Starling Medical College, Columbus, Ohio, 1866; Civil War veteran; formerly health officer of Morgantown; died, April 18, aged 78, from pneumonia.

William E. Adams, Madison, Ga.; Atlanta Medical College, Atlanta, Ga., 1891; honorary member of the Medical Association of Georgia; died, April 11, aged 54, from chronic nephritis.

Edward John Brearton, Boston; Tufts Medical College, Boston, 1905; member of the Massachusetts Medical Society; died, April 15, presumably from an overdose of an opiate, aged 43.

Howard Pascal Brisbane, Clarks, La.; Georgetown University School of Medicine, Washington, D. C., 1882; member of the Louisiana State Medical Society; died, March 27, aged 62.

Thomas Leonard James, Colorado Springs, Colo.; Medical Department University of Tennessee, Nashville, 1907; member of the Colorado State Medical Society; died, April 15, aged 38.

Fred Sinclair Fay ✠ Syracuse, N. Y.; Syracuse University College of Medicine, Syracuse, 1893; died, April 9, at the Onondaga County Hospital, as a result of an attack of hiccups.

John Lourie S. Hall, Chicago; Bennett College of Eclectic Medicine and Surgery, Chicago, 1878; Civil War veteran; member of the state legislature; died, April 26, aged 79.

Asa Watson Armington Traver, Providence, R. I.; Dartmouth Medical College, Hanover, N. H., 1894; Civil War veteran; died, April 22, aged 52, following a long illness.

Gordon M. Christine ✠ Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1880; cut his throat, April 17, while temporarily insane, aged 64.

Millard F. Brackney, Mooresville, Ind.; Medical College of Indiana, Indianapolis, 1890; served as captain, M. C., U. S. Army, in the World War; died, April 14, aged 55.

Needham Lawton Kirkland, Savannah, Ga.; Atlanta Medical College, Atlanta, 1914; died, April 14, aged 62, from septicemia, resulting from an abscess on his leg.

Thomas William Brewer, Oklahoma City; Barnes Medical College, St. Louis, 1901; member of the Oklahoma State Medical Association; died, April 11, aged 58.

Mark Trafton Newton, Webster, Me.; Medical School of Maine, Portland, 1884; died, April 10, aged 66, at the Central Maine General Hospital, Lewiston.

Mary B. Martin, Seattle; Barnes Medical College, St. Louis, 1903; died, April 14, from cerebral hemorrhage, following a motor accident, aged 66.

Elihu P. Washburn, Buffalo, Ind.; Medical Department, Butler University, Indianapolis, 1881; Civil War veteran; died, April 1, from pneumonia.

Oliver Davis Eastman ✠ Woodsville, N. H.; Dartmouth Medical School, Hanover, N. H., 1883; died, March 27, aged 63, following a long illness.

Thomas Benton Ashby ✠ Mount Airy, N. C.; College of Physicians and Surgeons, Baltimore, 1885; died, April 10, aged 50, from heart disease.

John W. McNabb, Fremont, Mich.; Kentucky School of Medicine of Louisville, 1894; member of the state legislature; died, April 14, aged 75.

Richard H. Alexander, Lansing, Mich.; Saginaw Valley Medical College, Saginaw, Mich., 1903; died, April 15, aged 54, from heart disease.

Henri Marchand, Champlain, Que.; Medical Department of Laval University, Quebec, 1887; died, February 4, aged 59, from heart disease.

Olivier Adolph Bruneau, Manchester, N. H.; Maryland Medical College, Baltimore, 1912; died, February 13, aged 34, from pneumonia.

Percy Harrison Garland, Glen Garden, N. J.; University of Vermont College of Medicine, Burlington, Vt., 1915; died recently; aged 32.

John B. Grant, Sparta, Ky.; Louisville Medical College, Louisville, 1878; died, April 12, aged 76, at Dayton, Ohio, from senility.

Jeptha W. Schureman ✠ Detroit; Detroit College of Medicine, Detroit, 1907; died, April 7, aged 42, from pleuropneumonia.

James H. More, Polo, Ill.; University of Buffalo Department of Medicine, Buffalo, 1853; died, April 20, aged 92, from senility.

Silas Alfred Cavalier, Beverly, W. Va.; Baltimore University School of Medicine, Baltimore, 1894; died, April 10, aged 66.

Adolph Belmont Smith ✠ Rockford, Ill.; Rush Medical College, Chicago, 1906; was accidentally drowned recently, aged 42.

Leonard Devore, South Sioux City, Neb.; Iowa Medical College, Des Moines, 1886; died, April 9, aged 77, from neuritis.

William H. Fitch, Rockford, Ill.; Chicago Medical College, Chicago, 1868; died recently, aged 78, from cerebral hemorrhage.

Herbert Reynolds, Philadelphia; Homeopathic Medical College of Pennsylvania, Philadelphia, 1865; died, April 18, aged 80.

William P. Gaffney, La Grange, Ga.; University of Georgia Medical Department, Augusta, Ga., 1881; died, April 9, aged 64.

William Getus Smith ✠ Ravenna, Ohio; Miami Medical College, Cincinnati, 1877; died, April 7, aged 67, from diabetes.

Joseph B. Hawkins, Mexico, Mo. (licensed, Missouri, 1883); also a minister; died, April 1, at St. Louis, aged 83.

Marion Crane, Lake Odessa, Mich. (licensed, Michigan, 1900); died, April 16, aged 78, from cerebral hemorrhage.

Thomas A. Shane, Columbus, Ind.; Pulte Medical College, Cincinnati, 1881; died, April 15, aged 82, from influenza.

Amos Wesley Fisher, Indianapolis; Physio-Medical College of Indiana, Indianapolis, 1881; died recently, aged 84.

Walter S. Payne, Wayne, Neb.; John A. Creighton Medical College, Omaha, 1903; died, March 7, aged 43.

J. P. McCollum, Jackson, Tenn. (licensed, Tennessee, 1889); died suddenly, April 15, from heart disease.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE JOURNAL'S BUREAU OF INVESTIGATION, OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER GENERAL MATERIAL OF AN INFORMATIVE NATURE

MORE MISBRANDED NOSTRUMS

Abstracts of Recent Notices of Judgment Issued by the Bureau of Chemistry of the United States Department of Agriculture

Vegetable Regulator and Iron Elixir.—Charles S. Miller, Vincennes, Ind., shipped in August, 1918, and January, 1919, quantities of "Iron Elixir" and "Improved Vegetable Regulator" which were misbranded. Analysis showed that "Iron Elixir" was a dilute, slightly acid, watery solution of sodium citrate and iron chlorid, with a slight trace of alcohol. It was falsely and fraudulently claimed that Iron Elixir was effective as a treatment, remedy and cure of pimples and boils, as a blood purifier and to remove from the blood "those humors and principles which disturb its purity." Vegetable Regulator was reported by the Bureau of Chemistry to be an alkaline watery solution containing aloes and baking soda, slightly flavored with oil of peppermint and with a small amount of alcohol present. It was falsely and misleadingly represented (1) as composed of vegetable substances and (2) to be guaranteed by the United States not to be adulterated or misbranded. As a matter of fact, it was not composed exclusively of vegetable substances nor guaranteed by the United States in any manner or for any purpose whatever. Furthermore, it was falsely and fraudulently claimed to be an effective treatment, remedy and cure for diseases of the liver, sick and nervous headache, sleeplessness, all diseases pertaining to the stomach and bowels, etc. In March, 1921, Charles S. Miller pleaded guilty and was fined $200 and costs.—[*Notice of Judgment No. 9764; issued Jan. 11, 1922.*]

Diuretine and Bloodzone.—The East India Medicine Co., St. Louis, Mo., shipped in June and July, 1920, a quantity of "Diuretine" and "Bloodzone."

When analyzed by the federal chemists Diuretine was reported to consist of potassium acetate, buchu extract, a laxative plant drug, oil of juniper berries, sugar, alcohol and water. The preparation was falsely and fradulently represented as a cure for acute Bright's disease, uremia, uremic convulsions, renal colic, inflammation of the bladder, rheumatism, heart disease, etc.

"Bloodzone," according to the federal chemists, consisted of extractives of plant drugs, including a laxative drug, sugar, alcohol and water. Bloodzone was falsely and fraudulently represented as a cure for syphilis, cancer, rheumatism, catarrh, boils, psoriasis, pimples and many other conditions.

In March, 1921, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment No. 9699; issued Jan. 7, 1922.*]

Grantillas.—The Eneglotaria Medicine Co., New York City, shipped a quantity of "Grantillas" from New York to Porto Rico. The government declared the preparation misbranded. Analysis of a sample of the article by the Bureau of Chemistry showed it to contain emodin-bearing (laxative) plant extractives and cramp bark. Among the claims made on the trade package were.

"Grantillas contain precisely the elements required by the genital organs of women . . . the best existing uterine tonic."

"Grantillas are a special medicine for diseases of ladies and young ladies . . . for peculiar diseases of the female sex . . . menstrual irregularities."

"In anemia and chlorosis Grantillas act as a first class general tonic. . ."

"Hysteria . . . is cured, no matter what its cause may be, with the use of Grantillas."

These and similar claims were declared false and fraudulent. In May, 1921, judgment of condemnation and forfeiture was entered and the court ordered that the product be released to the "Dr. Richards Dyspepsia Tablet Association," New York City, claimant, on payment of the costs and the execution of a bond in the sum of $200.—[*Notice of Judgment No. 9758; issued Jan. 11, 1922.*]

Winslow's Sarsaparilla Compound.—The Howard Drug and Medicine Co., Baltimore, Md., shipped a quantity of this preparation from Maryland to South Carolina in the spring of 1920.

Analysis of a sample showed the stuff to consist essentially of extract of plant material, including sarsaparilla, potassium iodid, glycerin, alcohol and water. The trade package contained such claims as:

"A Reliable Remedy For Scrofula, Chronic Ulcers, Cancerous Ulcers, Necrosis, Diseases of the Bones, Syphilitic Affection, Rheumatism, Female Weakness, Dyspepsia, Pimples and all Skin Diseases and the many Diseases arising from an Impure State of the Blood."

These and similar claims were declared false and fraudulent and, in November, 1920, the Howard Drug and Medicine Co., having admitted the allegations, judgment of condemnation and forfeiture was entered and the court ordered that the product be released to the claimant on payment of the costs of the proceedings and the execution of a good and sufficient bond.—[*Notice of Judgment No. 9774; issued Jan. 11, 1922.*]

VITAMINS IN FOODS

	"A"	"B"	"C"
BREAD, WHITE (WATER)	?	+	—
" , " (MILK)	+	+	?
" WHOLE WHEAT (WATER)	+	++	?
" , " (MILK)	++	++	?
BARLEY (WHOLE)	+	++	—
CORN, YELLOW	+	++	—
OATS	+	++	—
MEAT, LEAN	—•+	+?	+?
BEEF FAT	+	—	—
MUTTON FAT	+	—	—
PIG KIDNEY FAT	++	—	—
OLEOMARGARINE	+	—	—
LIVER	++	++	+
KIDNEY	++	++	+?
BRAINS	+	++	+?
SWEETBREADS	+	+	•
FISH, LEAN	—	+	•
" , FAT	+	+	•
" , ROE	+	++	+?
MILK, FRESH	+++	++	+V
" , CONDENSED	+++	++	+V
" , DRIED, (WHOLE)	+++	++	+V
" , SKIMMED	+	++	+V
BUTTERMILK	+	++	+V
CREAM	+++	++	+V
BUTTER	+++	—	—
CHEESE	++	•	•
COTTAGE CHEESE	+	•	•
EGGS	++	+	+?
ALMONDS	+	+	•
COCONUT	+	++	•
HICKORY NUTS	•	++	•
PEANUTS	+	++	•
PECANS	•	+	•
WALNUTS	•	++	•

	"A"	"B"	"C"
TOMATOES (RAW OR CANNED)	++	+++	+++
BEANS, KIDNEY	•	+++	•
" , NAVY	•	+++	—
" , STRING (FRESH)	++	++	++
CABBAGE, FRESH, RAW	+	+++	+?
" , COOKED	+	++	+?
CARROTS, FRESH, RAW	++	++	++
" COOKED	++	+	+
CAULIFLOWER	+	++	+
CELERY	•	+	•
CUCUMBER	•	+	•
DANDELION GREENS	++	++	+
EGGPLANT, DRIED	•	++	•
LETTUCE	++	++	+++
ONIONS	•	++	++
PARSNIP	—?	++	•
PEAS	++	++	+?
POTATOES (BOILED 15 MIN.)	•	++	+?
" (" 1 HOUR)	•	++	+?
" (BAKED)	•	++	+
SWEET POTATOES	++	+	•
RADISH	•	+	•
RUTABAGA	—?	++	+++?
SPINACH, FRESH	+++	+++	•
" , DRIED	+++	++	•
SQUASH, HUBBARD	++	•	•
TURNIPS	—?	++	•
APPLES	+	+	+
BANANAS	+?	+?	+
GRAPE JUICE	•	+	+
GRAPEFRUIT	•	++	++
LEMON JUICE	•	++	+++
ORANGE JUICE	+	++	+++
PRUNES	•	+	—
RASPBERRIES (FRESH OR CANNED)	•	•	+++

\+ contains the Vitamin
++ good source of the Vitamin
+++ excellent source of the Vitamin
— no appreciable amount of the Vitamin
? doubt as to presence or relative amount
• evidence lacking or insufficient
V variable

Because of the extent to which the present craze for vitamin concentrates is being exploited by shrewd "patent medicine" concerns, the Propaganda Department has added to the thirty-eight Educational Posters already issued two on vitamins. One of these (No. 39) is reproduced in miniature above; the other (No. 40) gives tersely a bare outline of our present knowledge of the accessory food factors. The original posters are 22 by 28 inches in size, and are printed on a good grade of nonglossy paper. They sell at 40 cents each, or $10 for the entire set of forty.

Correspondence

DR. GEORGE B. LORING—PIONEER IN SCIENTIFIC AGRICULTURE

To the Editor:—The editorial on "Our New Postmaster-General" (The Journal, March 11) is a worthy tribute to Dr. Hubert Work. It is noted that he is the first physician to be honored with a seat in the cabinet since Dr. James McHenry served as Secretary of War in the cabinets of Washington and Adams. This is, no doubt, true, and the medical profession may well be proud of such an able and versatile member as Dr. Work. It may not be generally known, however, that Dr. Work carries off this honor by a very narrow margin. Dr. George B. Loring of Massachusetts was appointed Commissioner of Agriculture by President Garfield in 1881. It was not for him, however, to enjoy the distinction of a seat in the cabinet, as the Department of Agriculture did not become one of the executive departments of the government until Feb. 11, 1889, at which time Commissioner Norman J. Colman, Dr. Loring's successor, was appointed by the President the first Secretary of Agriculture.

Dr. Loring was educated as a physician, but was postmaster at Salem, Mass., for four years, ending in 1857, and from that time devoted his attention to scientific farming and politics. He was president of the New England Agricultural Society for twenty-seven years prior to his death in 1891. Under Dr. Loring's administration of the federal bureau of agriculture, many projects were begun. He gave especial attention to the diseases of domestic animals. The study of inoculation which resulted in the discovery and use of mallein and other forms of vaccine made and distributed by the department was suggested in his report for 1883, and it was during his administration that the control of quarantine against diseased animals from foreign countries was transferred to the commissioner from the Treasury Department. Dr. Loring occupied no unimportant part in the early history of the United States Department of Agriculture.

George W. Pope, Washington, D. C.

DEFINITION OF THE PHYSICIAN IN INDUSTRY

To the Editor:—At a recent meeting, the Conference Board of Physicians in Industry adopted the following definition of the physician in industry:

"The physician in industry is one who applies the principles of modern medicine and surgery to the industrial worker, sick or well, supplementing the remedial agencies of medicine by the sound application of hygiene, sanitation and accident prevention; and who, in addition, has an adequate and cooperative appreciation of the social, economic and administrative problems and responsibilities of industry in its relation to society."

The discussion leading up to the formulation of this definition extended over several months. The question was viewed from all angles, and many suggestions were considered for including in the definition an outline of what his duties and functions were.

It was felt, however, that in order to avoid a complicated statement it would be better to include in a definition only the broad fundamental principles on which the work of the physician in industry is based, leaving to subsequent elaboration the finer details. It was pointed out that the definition adopted should emphasize both the medical attainments and the industrial requirements of the physician engaged in this work in order to make his duties clear both to the medical profession and to industrial management.

It is assumed that the physician engaged in industrial work is well grounded in the fundamentals of medicine and surgery. He is, first of all, a physician. It is obvious, however, that this alone, while equipping him for satisfactory service in private practice, does not meet fully the requirements of industrial work. In his industrial experience he has, of necessity, to deal with questions of sanitation, hygiene and accident prevention as applied to large numbers of people working in comparatively close association. Only by special knowledge of the work in hand will the physician be able satisfactorily to discharge his duties. His knowledge of plant processes, together with the physical examination of applicants for employment and of workers already engaged, will enable him by judicious placement to reduce materially the accident and morbidity hazard and rate.

It must be realized that many of the qualifications for successful medical work in industry are of a nonmedical nature, and call for a knowledge of the laws of social and industrial economics and of the administrative problems which arise in the conduct of an industrial medical department. The physician in industry must have a clear conception of the responsibilities of the industry to its workers and through them collectively to the community. On the other hand, he should recognize clearly the duties of workers to the industry in which they are engaged. It is an intelligent appreciation and consideration of these problems that make for the success of the work of the physician in industry.

It is hoped that this definition will tend to remove misconceptions as to the work of the physician in industry, and establish his position and his work on a basis satisfactory alike to the physician and to the industrial organization.

F. L. Rector, M.D., Secretary, New York.

"IS THE CONTROL OF DIPHTHERIA LEADING TO ERADICATION?"

To the Editor:—The recent article by Dr. Cumming (The Journal, March 4) raises the question whether diphtheria will be controlled and eradicated by the elimination of carriers, by active immunization with toxin-antitoxin, or by generalities similar to those given in the article. There are certainly no facts to suggest that immunization with toxin-antitoxin will result in a great increase in the number of carriers. On the contrary, the problem of the diphtheria carrier will be solved as soon as we have a diphtheria-immune population, in which no fresh cases can serve as foci for the spread of the bacteria and the development of large numbers of carriers. The only practical way to accomplish this will be by simplifying the process of immunization, omitting the Schick test for the determination of susceptibility in children from 6 months to 6 years of age, and injecting all young children wth toxin-antitoxin.

Dr. Cumming seems to think that successful active immunization with toxin-antitoxin would remove the danger signals of diphtheria in that the absence of clinical cases in such protected communities would give the health officer a false sense of security. He says that these communities would then become a source of danger to neighboring non-protected communities. This statement is evidently erroneous. It is known from long experience that when the number of clinical cases of a certain disease is diminished by immunization or other sanitary measures, the number of carriers is also gradually lessened to a minimum, and the virulence of the infecting organism tends to become attenuated. Active immunization with toxin-antitoxin would thus not only accomplish a reduction in the morbidity and mortality from diphtheria, but also be of great value in the control of the distribution of the disease.

Dr. Cumming objects that each generation would have to be immunized against diphtheria; but this is also necessary in smallpox vaccination. It would be necessary in every form of effective immunization against diseases, which can be kept down and eliminated only by the protective vaccination of the susceptible individuals of each generation.

Teaching of this character is misleading in that it places in the minds of the noncritical erroneous ideas of the measures for the control and eradication of a disease which still claims its victims by the tens of thousands.

ABRAHAM ZINGHER, M.D., New York.
Bureau of Laboratories, Department of Health, City of New York.

THE PROPHYLAXIS OF SYPHILIS

To the Editor:—The question sometimes arises as to the proper procedure in the case of exposure to known syphilis. Even when the evidence is presumptive, as in the handling of treated syphilitic patients, in rape, and when ordinary prophylaxis is neglected or delayed, the precaution of taking an intravenous injection of neo-arsphenamin, from 0.2 to 0.4 gm., should be encouraged. I have used this with success twice when the contaminated needle was accidentally jabbed into the operator's forearm, once with the injection intramuscularly of a small amount of syphilitic blood, once when an assistant's eye and cheek were splashed with blood, and several times when the hands were exposed in the collection of serum from a chancre and during operations on patients who had syphilis. The impossibility of sterilizing a puncture wound with mercurial ointment was recently demonstrated by a surgical friend. The routine use of strong mercuric chlorid solutions, so much in vogue in dental offices, dispensaries and operating rooms generally, should be condemned, as the resultant dermatitis allows, rather than prevents, syphilitic infection. Ordinarily, dependence can be placed on the use of green soap and an alcohol rinse.

IRWIN C. SUTTON, M.D., Los Angeles.

"TREATMENT OF PYLOROSPASM IN INFANTS"

To the Editor:—It is encouraging to hear that Dr. Grulee (THE JOURNAL, April 22, p. 1183) is obtaining such excellent results with atropin, which has become the general method of treatment of pylorospasm by the pediatricians of New York since first I called attention to its value in May, 1918, and in October, 1919. Lavage is not required in any of the cases if atropin is used in sufficient doses, and shortcomings in hygiene and diet are corrected. The atropin need be used hypodermically only in the severest cases; otherwise, the drug administered in the feeding is sufficient.

That pyloric stenosis is uncommon is beyond dispute; that it is a condition separate from pylorospasm is a debatable question; and, if one may predict on the basis of personal experience, the immediate future will show the error of this point of view. These cases also respond to atropin treatment, making it seem that they are merely a high degree of pylorospasm. The strictures placed upon thick gruel feeding, however well founded, can hardly nullify the satisfactory clinical experience with this method of treatment.

SIDNEY V. HAAS, M.D., New York.

Blindness in the United States.—It has been estimated by the Bureau of the Census that there were 52,617 blind persons in the United States in 1920, one to every 2,000 people. The New England States had the greatest number of blind persons, and the lowest amount of blindness was found in the Southwest Central States. It was further stated that 15,000 of the foregoing number are blind through industrial accident.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

WEIGHT OF NEW-BORN BABIES—EFFECT OF WATER AND OF SUGAR

To the Editor:—1. What percentage of babies born in institutions have their original birth weight at the end of one week? 2. Do babies in institutions gain as well as those in private homes? 3. Do authorities differ as to whether or not the amount of water given to babies during the first week has any effect as to weight, the increased water intake affecting the amount of nursing and thus causing a loss in weight? 4. Should dextrimaltose or any other sugar be given in water the first few days while awaiting the filling of the breasts? Please omit my name and address.

G. E., Wisconsin.

ANSWER.—1. Most babies born in institutions have regained their original birth weight by the tenth day.

2. If by institutions are meant hospitals where sick babies are cared for, they do not gain as well as infants in private homes. In well regulated orphan asylums, infants do almost as well as in private homes.

3. An infant should receive one tenth of its weight in total fluid intake after forty-eight hours. The necessary water should be given after or between nursings. By the tenth day they require one sixth of their body weight in fluids in twenty-four hours.

4. While awaiting the filling of the breasts, from 3 to 5 per cent. of sucrose or lactose may be added to the indicated amount of water.

PREVENTION OF DEAFNESS IN BOILER WORKERS

To the Editor:—Please give me, if possible, a list of articles and where they may be found, concerning "the methods of preventing deafness in men employed in boiler works or nail mills."

F. F. SLYFIELD, M.D., Duluth, Minn.

ANSWER.—

Kober and Hanson: Diseases of Occupation and Vocational Hygiene, Philadelphia, P. Blakiston's Son & Co., 1916, pp. 339-350.
Harris, L. I.: Clinical Types of Occupational Diseases: Study of Methods for Their Prevention, THE JOURNAL, Sept. 20, 1919, p. 880.
Guild, S. R.: Prevention of War Deafness: Critical Review, *J. Lab. & Clin. Med.* **2**: 12 (Sept.) 1917; War Deafness and Its Prevention, ibid. **3**: 226 (Jan.) 1918; War Deafness and Its Prevention, ibid. **3**: 358 (March) 1918.
McBride and Turner: War Deafness and Vestibular Tracts, *Lancet* **2**: 73 (July) 1918.
Baratoux, J.: War Deafness, *Progrès méd.* **32**: 139 (April 28) 1917.
Hays, M. M.: Needed Measures for the Prevention of Deafness During Early Life, THE JOURNAL, July 23, 1921, p. 263.

MERCURIC IODID FOR INTRAMUSCULAR INJECTION

To the Editor:—I am anxious to have some mercuric iodid, dissolved in oil, prepared for intramuscular medication. Can you give me a formula whereby I can secure a clear, oily solution of the iodid, combined with a small amount of quinin and urea hydrochlorid, to relieve the irritation produced by the medicine? Any information you may give me will be very much appreciated. Omit my name, please.

D. C. B., Iowa.

ANSWER.—Quinin and urea hydrochlorid is insoluble in oils, so that it would be impracticable to prepare an anesthetic solution of the kind desired. New and Nonofficial Remedies describes an oily solution of mercuric iodid which has been made anesthetic by the addition of benzocain. A similar preparation could be put up by the pharmacist as given herewith:

	Gm. or C.c.	
Hydrargyri iodidi rubri	0.01	gr. ⅙
Benzocainae	0.01	gr. ⅙
Olei olivae, q. s. ad	1.0	♏ xv

PHENOL IN ANTITOXIN

To the Editor:—Please inform me how much phenol there is, by weight, in a 10,000 unit dose of diphtheria antitoxin.

S. S. WARREN, M.D., Mescalero, N. M.

ANSWER.—For some time the amount of phenol (carbolic acid) in biologic products was fixed by the regulations of the Treasury Department as not more than 0.2 per cent., but according to recent information, the amount now is 0.3 per cent.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

ARKANSAS: Little Rock, May 9. Sec., Reg. Bd., Dr. J. W. Walker, Fayetteville. Sec., Eclec. Bd., Dr. C. E. Laws, 803½ Garrison Ave., Fort Smith. Sec., Homeo. Bd., Dr. Geo. W. Love, Rogers.

DELAWARE: Wilmington, June 20. Sec., Homeo. Bd., Dr. H. W. Howell, 824 Washington St., Wilmington.

FLORIDA: Tampa, June 12-13. Sec., Dr. W. M. Rowlett, Tampa.

GEORGIA: Augusta, May 31-June 2; Atlanta, June 7-9. Sec., Dr. C. T. Nolan, Marietta.

IOWA: Iowa City, June 1-3. Sec., Dr. Rodney P. Fagen, Capitol Bldg., Des Moines.

KANSAS: Kansas City, June 20. Sec., Dr. Albert S. Ross, Sabetha.

KENTUCKY: Louisville, May 22. Sec., Dr. A. T. McCormack, State Board of Health Bldg., Louisville.

LOUISIANA: New Orleans, June 8-10. Sec., Dr. Roy B. Harrison, Hibernia Bank Bldg., New Orleans.

MASSACHUSETTS: Boston, May 9-11. Sec., Dr. Samuel H. Calderwood, 144 State House, Boston.

MICHIGAN: Ann Arbor, June 13. Sec., Dr. Beverly D. Harison, 504 Washington Arcade, Detroit.

MINNESOTA: Minneapolis, June 6-8. Sec., Dr. Thomas S. McDavitt, 539 Lowry Bldg., St. Paul.

NATIONAL BOARD OF MEDICAL EXAMINERS. Written examination in Class A medical schools. Parts I and II, June 19-23 and Sept. 25-29. Sec., Dr. John S. Rodman, 1310 Medical Arts Bldg., Philadelphia. Applications for the June and September examinations must be sent in, respectively, by May 15 and June 1.

NEBRASKA: Lincoln, June 6-8. Sec., Mr. H. H. Antles, Lincoln.

NEW YORK: Albany, Buffalo, New York and Syracuse, May 22-25. Asst., Professional Examination, Mr. Herbert J. Hamilton, State Education Bldg., Albany.

OHIO: Columbus, June 6-9. Sec., Dr. H. M. Platter, Hartman Hotel Bldg., Columbus.

TEXAS: Austin, June 20-22. Sec., Dr. T. J. Crowe, 918-19 Dallas County Bank Bldg., Dallas.

VIRGINIA: Richmond, June 20-23. Sec., Dr. J. W. Preston, 511 MacBain Bldg., Roanoke.

WYOMING: Cheyenne, June 5-7. Sec., Dr. J. D. Shingle, Cheyenne.

REPORT OF THE TWELFTH EXAMINATION OF THE NATIONAL BOARD OF MEDICAL EXAMINERS

The twelfth examination of the National Board of Medical Examiners was the beginning of examinations held under the new plan. Examinations were held in eighteen Class A medical schools, February 15, 16 and 17, in Part I, which comprises written examinations in each of the six fundamental medical sciences. The subjects of the examination and the relative value of each were: anatomy, 100; physiology, 75; materia medica and pharmacology, 75; pathology, 75; physiologic chemistry, 50, and bacteriology, 50, making a total of 425 counts for this part.

Part I

A candidate taking Part I must earn at least 75 per cent. of this total. The number of counts earned in any subject depends directly on the ratings of the answered papers. Falling below 65 per cent. in two subjects or below 50 in one subject constitutes a failure. Eighty-seven candidates appeared for examination in Part I; of these, eighty passed and seven failed.

PASSED, PART I

Names and College	Year of Graduation
Denver M. Vickers, Harvard Medical School	1921
Alfred Maurice Wakeman, Yale University Medical School	1922
Joseph M. Hayman, Jr., University of Pennsylvania	1921
Pierre Jaque Walker, Johns Hopkins Medical School	1923
Lewis M. Hurxthal, Harvard Medical School	1923
Curtis H. Lohr, Washington Univ. School of Medicine	1922
Norman Joseph Kilborne, Rush Medical School	1924
Alfred DeBard Biggs, Rush Medical School	1921
Leon L. Gardner, University of Pennsylvania	1920
Mary Bailey Sloan, Woman's Medical College	1922
Meredith Everet Waitman, Johns Hopkins Medical School	1923
Wayne J. Stater, Harvard Medical School	1921
Walter C. Earle, Rush Medical School	1920
Aloysius P. Rieman, New York Univ. & Bellevue Hosp. Coll	1922
Paul R. Rockwood, State Univ. of Iowa Med. College	1919
John L. Goforth, Johns Hopkins Medical College	1923
Tyree C. Wyatt, Syracuse Univ. School of Medicine	1922
William E. Sisson, Johns Hopkins Medical College	1922
Dorothy M. Moore, Johns Hopkins Medical College	1922
William E. Dodd, University of Pennsylvania	1920

AVERAGES OBTAINED IN PART I*

Candidate's Number	Anatomy, Value 100	Chemistry, Value 50	Materia Medica and Pharmacology, Value 75	Pathology, Value 75	Physiology, Value 75	Bacteriology, Value 50	Final Averages
4	82.3	92	82	86	90	80	361.8
6	79.5	95	87.5	80	89	88	363
8	72.4	90	77	90	91	84	352.9
13	76.3	85	82.5	76	84	76	338.7
14	85.9	90	79	82	83	76	352
15	73.5	90	77	82	91	82	347
16	87.5	90	80	84	93	84	367.3
17	78	90	75	76	84	82	340.3
20	71.5	95	86	92	84	86	358.5
22	70.4	90	75	64	84	76	320.7
25	91.2	92	78	88	89	82	369.5
27	75.6	85	73	60	91	78	325.2
28	87.4	96	83	90	85	78	368
34	73.4	92	78	78	80	80	336.4
35	69.6	80	82	80	85	76	332.9
37	81.5	90	57	84	83	84	336.6
38	91.9	96	82.5	92	96	76	380.8
42	54.4	78	72.5	84	90	76	316.3
43	80.5	90	77	92	88	76	356.2
44	68.2	90	80	78	93	70	336.5
45	77.2	80	78	78	91	70	337.5
46	73	88	81	80	88	76	341.8
50	68.2	90	82	60	80	80	319.7
51	61.4	90	76	80	88	70	324.4
52	81.8	95	84	84	86	70	352.3
54	77.7	84	75	60	84	72	320
56	80.5	80	70	70	85	76	327.3
57	57.8	90	73	88	90	88	335.1
61	80.1	90	80	68	83	76	336.4
62	66.5	90	76	80	84	76	329.5
66	83.5	92	81	80	89	88	361.1
70	86.7	80	77.5	76	91	88	374.2
71	81.4	90	86	88	88	82	363.9
73	81.2	87	..	84	86	80	256.6
74	74.1	95	82	78	92	76	348.6
77	76.4	92	84	88	86	76	353.9
79	74.8	84	75	78	84	70	329.6
80	83.1	92	79	90	85	76	357.7
82	79.6	88	74	76	86	72	336.6
83	82.8	84	77	92	94	82	365.3
84	69.6	80	76	60	85	76	317.4
85	81.3	92	76	92	89	82	361.1
86	87	88	74	80	93	70	351.3
87	80	90	80	88	92	82	361
88	70.7	88	67.5	72	91	72	324.7
92	67.7	85	79	60	80	72	310.5
96	83.9	95	81	76	90	76	354.7
97	67.5	88	77	72	90	70	325.8
98	82.5	92	82	84	91	82	362.3
99	87.9	95	85	86	95	84	379.5
100	67.8	78	83	74	86	70	321.1
101	61.8	80	76	68	78	72	304.3
102	85.2	90	82.5	92	94	76	369.6
104	77.6	90	82.5	72	90	76	344
105	85.6	90	85	96	98	84	381.8
108	80.5	92	74	84	82	78	345.5
109	72.6	85	73	60	75	60	301.2
110	83.7	90	79	68	81	76	337.8
111	75.8	82	58	56	93	76	310.0
113	90.2	86	80	80	92	86	365.2
114	81.9	85	80	76	79	74	342.7
118	71.5	88	75	80	81	78	353.6
120	75.1	95	75	84	87	80	347.2
121	71.4	90	79	72	76	70	321.7
123	75.9	82	80	88	83	92	351.2
125	89.8	84	83	80	88	86	363.1
130	63	85	77	68	80	70	308
131	82	90	..	76	92	84	295
132	78	80	82.5	76	88	72	358.9
134	82.1	90	79	88	87	88	361.7
135	71.5	90	79	92	82	78	344.8
136	76	90	76	80	80	70	333
138	76.3	80	75	84	86	82	345.1
140	75	90	80	86	92	88	357.5
141	80.8	90	82	68	90	78	344.8
142	87.3	84	76	68	94	86	350.8
143	59.3	95	..	80	90	78	273.3
145	68.1	88	72	76	91	78	330.4
146	87.4	92	78	88	88	92	369.9
149	81.3	90	82	76	88	84	352.8
150	74.4	88	81	86	90	76	369.2
152	87.5	92	82	80	90	92	368.5
154	66.7	88	72	84	90	76	333.2
155	78.6	82	78	60	87	76	326.4
159	81.5	80	75	84	91	88	353.1
160	70.3	82	77.5	76	80	78	325.4
162	85.4	80	80	88	90	76	356.9

* The general average of the candidates is based on subject values as rated by the board. The averages in each subject are on a basis of 100; 1,000 is the total perfect mark as rated by the board for the entire examination; 425 is the maximum mark on this basis for Part I.

Matilde L. Maerz, Woman's Medical College....1922
Ruth P. Stone, Univ. of Michigan School of Med....1923
Lee Fosbay, University of Pennsylvania....1920
William J. Scott, Johns Hopkins Medical College....1923
James McG. Sullivan, St. Louis Univ. Medical School....1923
Sadie MacFarland, Woman's Medical College....1921
David T. Ford, Univ. of Nebraska College of Med....1921
Miriam Bell, Woman's Medical College....1922
Harbert P. Miller, State Univ. of Iowa School of Med....1921
Allen M. Kilgore, Rush Medical School....1918
Nelsen K. Forster, Univ. of Illinois College of Med....1919
Dan C. Darrow, Johns Hopkins Medical College....1920
Paul M. Hamilton, Johns Hopkins Medical College....1922
Howard W. Schaffer, University of Pennsylvania....1921
Robert G. Craig, Johns Hopkins Medical College....1922
Edward L. Bortz, Harvard Medical School....1923
Merlin T. R. Maynard, Washington Univ. School of Medicine....1922
Abram E. Bennett, Univ. of Nebraska School of Medicine....1921
Max S. Schaul, University of Pennsylvania....1920
Doris Orlenda Tuttle, Woman's Medical College....1922
Richard W. Pullen, Yale University School of Medicine....1921
Esther M. Greisheimer, Tufts Coll. Medical School....1922
Walter H. Spoenemann, Rush Medical School....1920
J. Herbert Tinsman, University of Pennsylvania....1921
Mary H. Jennings, Woman's Medical College....1921
Joseph T. Eagan, Yale Univ. School of Medicine....1921
Harry M. Hayter, Johns Hopkins Medical College....1923
Charles Szkilas, Harvard Medical School....1921
Joseph R. Blaloçk, Johns Hopkins Medical School....1922
Mildred Rogers, Woman's Medical College....1921
Walter H. Fink, Univ. of Minnesota School of Med....1921
Charles E. Buell, Jr., Johns Hopkins Medical College....1922
Merritt P. Starr, Rush Medical School....1921
James C. Potter, Johns Hopkins Medical School....1921
Ruth L. Carpenter, Woman's Medical College....1922
Francis E. Shields, Woman's Medical College....1922
Ruth N. Miller, Woman's Medical College....1922
Woodruff Smith, Johns Hopkins Medical College....1918
Myrta M. Wilson, Rush Medical School....1922
Vincent G. Hawkey, University of Pennsylvania....1921
Thomas C. Smith, Johns Hopkins Medical College....1922
Marian C. Putnam, Johns Hopkins Medical College....1921
Lee De Cady, Washington Univ. School of Medicine....1923
Zacharias Bercovitz, Rush Medical College....1922
Lillian E. Shaw, Woman's Medical College....1922
Oscar H. Stover, University of Buffalo Medical Dept....1922
Frank G. Moore, Johns Hopkins Medical College....1922
M. G. A. Neupauer, Jefferson Medical College....1921
Horace E. Campbell, Univ. of Nebraska School of Medicine....1922
William W. Haggart, Harvard Medical School....1922
Mary A. Hipple, Woman's Medical College....1922
Florence E. Ahlfeldt, Woman's Medical College....1920
Emily L. Van Loon, Woman's Medical College....1922
Emily Gardner, Woman's Medical College....1922
Elizabeth L. Ewing, Woman's Medical College....1922
Justus B. Rice, Washington Univ. School of Medicine....1922
Anna R. Winter, Woman's Medical College....1923
Sam A. Overstreet, Univ. of Louisville Medical Dept....1923
Clara R. King, Woman's Medical College....1923
Isla Gertrude DePree, Univ. of Michigan School of Medicine....1922

FAILED

Johns Hopkins Medical College....1922
Univ. and Bellevue Hospital Medical College....1923
Johns Hopkins Medical College....1922
Woman's Medical College....1922
Tufts College Medical School....1923
Rush Medical School....1920
Washington Univ. School of Medicine....1922

ANATOMY

Answer any ten of the following questions: 1. Give a brief description of the development of the brain. 2. Make a diagram of a cross-section of the spinal cord in the lower cervical region. Designate the tracts and name their functions. 3. Describe the oral cavity as it appears in the normal conditions. Illustrate and designate the histologic structures in: (*a*) the lip; (*b*) the pharynx; (*c*) the tonsil. 4. Describe the stomach, giving its position, form, size, attachments, blood and nerve supply. Illustrate and designate the histologic structures in sections of the fundus and pylorus. 5. Describe the kidney, giving its position, form, attachments, blood and nerve supply. Make a sketch of a uriniferous tubule showing the character of the epithelium in its various parts. 6. Name the bones of the lower extremity. 7. Name the principal muscles of the lower extremity and state their functions. 8. Indicate by diagram the topographic relations of: (*a*) the femoral artery at the apex of the femoral trigon; (*b*) the popliteal artery; (*c*) anterior tibial artery in lower third of leg. 9. Name the principal nerves of the lower extremity and indicate which structures or areas they innervate. 10. Describe the knee-joint.

As an alternative for questions 6, 7, 8, 9 and 10 the candidate may answer the following questions: 11. Name the bones of the upper extremity. 12. Name the principal muscles of the upper extremity and state their functions. 13. Indicate by diagram the topographic relations in cross-sections of the upper extremity: (*a*) midway between the shoulder and elbow; (*b*) midway between the elbow and wrist. 14. Name the principal nerves of the upper extremity and indicate which structures or areas they innervate. 15. Describe the elbow-joint.

PHYSIOLOGIC CHEMISTRY

Answer any five of the following questions: 1. What is meant by nitrogen equilibrium? Mention five common protein foods; describe the gastric digestion of the protein constituents of these foods; give in detail the results of normal pancreatic digestion of proteins. 2. What are the essential end products of the alimentary digestion of proteins; from what part of the alimentary tract are these absorbed; what changes do they undergo after absorption; what internal organs are chiefly concerned in the metabolism of the absorbed products of protein digestion; how are the final products of protein metabolism eliminated? 3. What is the chemistry of the nucleins? Mention some foods which are rich in nuclein; what are the effects of gastric and pancreatic digestion on the nucleins? 4. From what part of the alimentary canal are the products of the digestion of nuclein absorbed; what internal organs are concerned in their further metabolism? 5. What body tissues contain relatively large amounts of nuclein; how are the products of the metabolism of nucleins eliminated from the body? 6. Give the origin, composition, function and final disposition of the red blood corpuscles; in what form are their chief constituents eliminated from the body? 7. Give the chief chemical constituents of bacterial cell substance; what are the chemical reactions between the constituents of bacteria and those of the animal body? 8. Trace through the animal body a carbohydrate food, giving in detail its digestion, absorption, assimilation and elimination. 9. Give the origin, function and elimination of bile pigments; state where in the body they are formed, out of what they are formed, into what they are converted, and what, if any, function they perform in health. 10. Discuss the vitamins; give their classification and state in detail their relation to nutritional disorders.

MATERIA MEDICA, PHARMACOLOGY AND THERAPEUTICS

Answer all questions: 1. (*a*) Discuss the action of hypnotic drugs. (*b*) Give three examples of drugs used as hypnotics. (*c*) Discuss the antispasmodic action of hydrated chloral and give two indications for its use with this purpose in view. 2. (*a*) Upon which pharmacologic actions of morphin does its therapeutic use mainly depend? (*b*) Explain the occasional occurrence of convulsions after the administration of morphin to children. (*c*) Is there any danger connected with the administration of morphin to a nursing mother? 3. (*a*) Define caffein and theobromin. (*b*) Discuss the pharmacologic action of caffein with reference to its use in heart disease. (*c*) Discuss the dangers incident to the intravenous injection of caffein. 4. (*a*) Discuss the pharmacologic actions of epinephrin, particularly with reference to the different methods of administration. (*b*) Give the therapeutic indications based on these actions. 5. (*a*) Discuss digitalis action as illustrated by animal demonstration. (*b*) In the administration of digitalis, which effects are to be specifically noted as indicative of digitalis action and as signs for diminishing the dose or discontinuing it altogether? 6. Write separate prescriptions for each of the three following drugs: caffein; iron; bismuth. In each instance express the ingredients in both metric and apothecary terms; add full direction to the patient; state the dose intended; give the disease conditions for which the drug is prescribed.

PATHOLOGY

Answer any six of the following questions: 1. Given an injection of virulent staphylococci into a thigh muscle of a guinea-pig: Describe in detail the course of events which may follow. 2. Discuss the various uses and meanings of the word "hyaline." 3. What extraneous pigments are found in the body? How may they be recognized? 4. Tabulate the occurrence of lipoids in the body under the following headings: (*a*) Neutral fats as adipose tissue. (1) Normal locations. (2) Pathologic deposits. (*b*) Neutral fats in cells. (1) Normal. (2) Pathologic. (*c*) Cholesterin. (1) Normal. (2) Pathologic. 5. Discuss the essential gross and microscopic differences seen in carcinoma of the stomach. 6. What diseases are supposed to be associated with disturbances of the pituitary? Describe one of these and the changes usually found in the pituitary. 7. Differentiate grossly and microscopically bacillary and amebic dysentery. 8. Detail the technic to be used and the points to be especially noted in a routine examination of the pericardial sac and the heart.

PHYSIOLOGY

Answer any five of the following questions: 1. Explain the cause of the closure and opening of the different sets of valves in the heart, and give the phases in the cardiac cycle during which each set of valves is closed. 2. State the average pressure and velocity of the blood in the arteries, capillaries and veins, respectively, and tell why the pressure and velocity change as the blood passes from the arteries to the capillaries and veins. 3. Explain the dangers of transfusing an incompatible blood, and tell how you would determine whether or not the blood of A is compatible with that of B, so that A's blood could safely be transfused into B. 4. Describe the normal movements of the stomach and the mechanism of the pyloric sphincter (*a*) after a mixed meal, and (*b*) when water is taken without solid food. 5. Explain the mechanism controlling the outpouring (*a*) of bile, and (*b*) of pancreatic juice into the intestine following a meal. 6. (*a*) Describe the structural and functional change which occurs in the peripheral end of a nerve that has been cut and sutured. (*b*) Compare the structural change produced by cutting a peripheral nerve with that which occurs in the tracts of the spinal cord after these have been severed.

BACTERIOLOGY

Answer any five of the following questions: 1. (*a*) Given a patient suspected of having diphtheria, what steps would you take to establish the diagnosis? Include description of culture mediums employed, technic for staining and morphology of organism. (*b*) When a positive diagnosis is established, what measures would you institute to safeguard immediate contacts against diphtheria? 2. (*a*) How would you determine bacteriologically whether a given organism from a patient is a *Streptococcus hemolyticus, Streptococcus viridans* or a pneumococcus? (b) Give details of bacteriologic procedures involved. 3. Given a case of typhoid fever: (*a*) From what sources or through what routes could the patient have acquired the infection? (*b*) In what portions of the body are the typhoid bacilli ordinarily found during the first ten days of illness; during the third and fourth weeks; and after convalescence? (*c*) When a typhoid patient becomes a "chronic carrier," in what parts of the body do the typhoid bacilli usually establish their foci and how are they excreted? 4. (*a*) What is the significance of *Bacillus coli* in water supplies? (*b*) What is meant by the presumptive test for *Bacillus coli* and how would you carry it out on a specimen of water? 5. What are the differences in immunologic principles underlying: (*a*) Pasteur's treatment of rabies? (*b*) Smallpox vaccinations? (*c*) Treatment with diphtheria antitoxin? (*d*) Antityphoid vaccination? 6. (*a*) To what diagnostic procedures has the technic of the complement-fixation reaction been successful applied in man and animals? (*b*) What are the principles on which this technic is based?

Part II

Part II of the examination was held in eight of the medical schools mentioned above, February 20 and 21. This was also a written examination in the following subjects and with the relative values assigned: medicine, 75; surgery, 75; obstetrics and gynecology, 50; public health, 25, making a total of 225 counts for this part. A candidate taking Part II must earn at least 75 per cent. of this total. The number of counts earned in any subject depends directly on the ratings of the answered papers. Falling below 65 per cent. in two subjects or below 50 in one subject constitutes a failure.

Twenty-one candidates appeared for examination in Part II. Of those, eighteen passed and three failed.

Names and College	PASSED	Year of Graduation
Walter C. Earle, Rush Medical School		1920
Denver M. Vickers, Harvard Medical School		1921
Sadie MacFarland, Woman's Medical College		1921
Joseph M. Hayman, Jr., University of Pennsylvania		1921
Herbert P. Miller, State University of Iowa School of Med		1921
Lee Fosbay, University of Pennsylvania		1920
Dan C. Darrow, Johns Hopkins Medical School		1920
Paul R. Rockwood, State University of Iowa School of Med		1919
Allen M. Kilgore, Rush Medical School		1918
Richard W. Pullen, Yale University School of Medicine		1921
Joseph T. Eagan, Yale University School of Medicine		1921
Alfred DeBard Biggs, Rush Medical School		1921
M. G. Adolph Neupauer, Jefferson Medical College		1921
Marian C. Putnam, Johns Hopkins Medical School		1921
William Earle Dodd, University of Pennsylvania		1920
Walter H. Spoenemann, Rush Medical School		1920
J. Herbert Tinsman, University of Pennsylvania		1921
Mary H. Jennings, Woman's Medical College		1921
	FAILED	
Harvard Medical School		1921
Woman's Medical College		1920
Johns Hopkins Medical School		1918

AVERAGES OBTAINED IN PART II*

Candidate's Number	Medicine, Value 75	Surgery, Value 75	Obstetrics and Gynecology, Value 50	Public Health, Value 25	Final Averages
57	51.5	77	80	75	119.4
77	79.5	92	85	67	187.9
83	57.5	90	80	67	167.4
85	76.5	82	75	77.5	175.6
96	86.5	80	95	76	191.4
99	90.5	87	85	75	196.9
104	76	85	90	75	184.4
105	92	91	90	89.5	204.7
108	73.5	85	75	76.5	175.5
113	96.5	95	85	90	208.7
120	80	84	90	78.5	187.6
121	74	75	70	70	164.3
125	84.5	89	80	81	190.4
132	85	85	90	74	191.1
135	55	82	95	79.5	170.2
140	89	88	95	69	197.5
141	77.5	78	75	82.5	174.7
145	76	83	85	60.5	176.9
150	87.5	80	75	81	183.3
159	90.5	89	75	74	190.7
160	74	83	85	69	177.5

* The general average of the candidates is based on subject values as rated by the board. The averages in each subject are on a basis of 100; 1,000 is the total perfect mark as rated by the board for the entire examination; 225 is the maximum mark on this basis for Part II.

MEDICINE

Answer all questions: 1. (*a*) What combination of physical signs would warrant a diagnosis of pleurisy with effusion? (*b*) What are the indications for aspiration in this condition? (*c*) Describe the technic of aspiration. 2. (*a*) Describe the conditions of the circulatory system which usually accompany chronic interstitial nephritis. (*b*) What evidence would lead you to conclude in such a case that cardiac insufficiency had set in? (*c*) How would you treat this cardiac insufficiency? 3. (*a*) Define acute miliary tuberculosis. (*b*) How may it originate? (*c*) Describe the type known as an acute general infection and tell how you would differentiate it from typhoid fever. 4. In a case of apoplexy with right motor hemiplegia occurring in a man 52 years of age, discuss the conditions which would determine your diagnosis as between thrombosis, embolism and hemorrhage. 5. Define and discuss hemophilia, and differentiate it from purpura hemorrhagica. 6. Contrast the spinal fluid obtained by lumbar puncture in acute poliomyelitis and in cerebrospinal fever. 7. (*a*) Define nephrolithiasis. (*b*) On what evidence would you base a diagnosis of renal colic? Time allowance, three hours. Allow thirty minutes each to Questions 1, 2 and 3; fifteen minutes each to questions 4, 5, 6 and 7, and thirty minutes for review. The object of this examination is to test your grasp of the problems in medicine presented by the diseases mentioned. Intelligent, *concise* discussion counts for much more than the mere recapitulation of facts. You may well utilize the full time allowance for each question, remembering that quality counts for more than quantity.

SURGERY

Answer any seven of the following questions: 1. Give the differential diagnosis of tuberculosis, stone and tumor of the kidney. Indicate treatment. 2. Discuss the differential diagnosis of surgical lesions causing blood in the stool. 3. Name and discuss the diagnosis of the local surgical complications and sequelae of acute and chronic gall tract infection. 4. Discuss the differential diagnosis of syphilis, tuberculosis and carcinoma of the tongue. Indicate treatment. 5. Discuss the treatment of simple uncomplicated fracture of the upper third of the femur. 6. Discuss causes, symptoms and treatment of strictures of the male urethra. 7. Discuss surgical conditions of the knee-joint, giving causes, diagnosis and treatment. 8. Gangrene of the foot. Discuss varieties, causation and treatment.

OBSTETRICS

Answer all questions: 1. (*a*) Give in detail the treatment of a postpartum hemorrhage, with the placenta retained. (*b*) What precautions should be taken during labor to prevent such an occurrence? 2. How would you manage a prolonged labor during the first stage due to: (*a*) Uterine inertia with "rigid cervix?" (*b*) Occiput posterior position? (*c*) Mention some other common causes of undue prolongation of the first stage of labor. 3. What is the treatment of obstinate vomiting in the early months of pregnancy? 4. What are the indications for the operation: (*a*) High forceps? (*b*) Version followed by breech extraction? 5. How would you make a diagnosis and outline the symptoms and treatment of a streptococcus infection of the uterus after delivery at full term?

GYNECOLOGY

Answer all questions: 1. Describe the management of a case of sterility, mentioning the common causes, with diagnosis and treatment. 2. Discuss the etiology, symptoms and treatment of tuberculosis of the female organs of generation. 3. Diagnosis, symptoms and treatment of acute gonorrhea in women. 4. Differential diagnosis of acute postoperative gastric dilatation and its treatment. 5. Clinical history, diagnosis and treatment of acute hydronephrosis.

PUBLIC HEALTH

HYGIENE

Answer all questions: 1. Discuss management of a massive outbreak of typhoid fever in a city of 75,000. 2. Discuss sewage disposal for an inland city of 50,000. 3. Discuss measures for the prevention and control of malaria. 4. Discuss the factors in the problem of infant mortality. 5. Discuss the prevention of: (*a*) beriberi; (*b*) pellagra. 6. Discuss the eradication of diphtheria.

MEDICAL JURISPRUDENCE

Answer all questions: 1. Discuss the duties of a coroner. 2. How would you determine whether or not a dead infant had ever lived? 3. How would you differentiate between blood stains of human and animal origin? 4. Discuss the diagnosis of poisoning by strychnin.

Social Medicine

ANTIVIVISECTION CAMPAIGN IN ST. LOUIS

St. Louis saw the defeat, April 19, 1922, of an active antivivisection campaign which had seriously threatened the progress of medical teaching and research in that city since Jan. 27, 1921. For many years the medical schools of St. Louis had obtained dogs necessary for teaching and research from the pound simply by an agreement with certain city officials; but in January, 1921, the Humane Society secured control of the pound, and the supply of dogs to the medical schools immediately stopped. Through the courtesy of the mayor, a promise of sufficient dogs to finish out the school year was made by the Humane Society, but the promise was not fulfilled, and not a single dog was forthcoming. The real intention of the Humane Society was not disclosed, however, until later, when boys and men bringing dogs to the schools were threatened with arrest, and a reward was offered by the Humane Society for information leading to the arrest and conviction of parties taking up stray dogs and delivering them to the medical schools. These activities brought about a condition which necessitated discontinuing certain courses in the medical schools for a time, and entirely stopped research on dogs in many departments. To meet this emergency, the dean of Washington University School of Medicine started a counter campaign, and succeeded in having introduced into the chamber of aldermen an ordinance which

provided that whenever a school of medicine that was recognized by the state board of health applied for impounded dogs for necessary teaching and study of medicine, the animals would be delivered for a fee of 75 cents to cover the expense of taking them up and caring for them. The fight in St. Louis thus assumed a different aspect than had been the custom in other cities. The medical profession now assumed the offensive, and put the antivivisectionists in such a position that it was necessary for them to prove the worthiness of their cause.

STEPS IN THE CAMPAIGN

A joint committee from the Washington University School of Medicine and the St. Louis University School of Medicine was organized. This committee later included the health commissioner of the city of St. Louis, who acted as chairman. Plans were outlined whereby the committee was to get in touch with the medical societies, hospitals, physicians, chamber of commerce, prominent business concerns, women's organizations, and prominent ministers and lawyers, and to ask their endorsement of the proposed ordinance. It was also planned to inform the mayor and aldermen of the necessity of such measures and to get in immediate touch with prominent politicians of the city. The Barnard Free Skin and Cancer Hospital immediately gave its support to the committee and promised to become active if necessary. Prominent ministers also pledged their support. Feb. 24, 1922, the St. Louis *Post Dispatch* announced that the board of directors of the Humane Society had met at the Planters Hotel and decided to appeal to the aldermanic committee to which the bill was assigned to kill the bill in the committee. The president stated that an intensive campaign would be planned if the committee reported the bill favorably to the board of aldermen. Shortly afterward, large quantities of antivivisection literature in the way of pictures of Pawlow dogs, a living dog in a crematory, numerous devices for holding dogs, and anatomic dissections were evident throughout the city, and large numbers of letters were sent to the committee and prominent politicians.

ORGANIZATION OF THE MEDICAL FORCES

It was time now to organize the medical forces. In conference the president of the Missouri State Medical Association, the president of the St. Louis Medical Society, the chairman of the committee on publicity of the St. Louis Medical Society, and the vice dean of St. Louis University drafted tentative resolutions which were brought before the St. Louis Medical Society, February 28. At this meeting short addresses were made, and copies were given to reporters of the four newspapers who were present. March 2, a copy of the resolutions, and a letter urging every physician to see his alderman and to bring the question before his patients were in the hands of every member of the St. Louis Medical Society. The resolutions were as follows:

WHEREAS, The unrestricted use of animals is absolutely essential for the teaching of medicine and the conquest of disease not yet completely brought under control, and

WHEREAS, It is only through the use of animals that medicine can be taught, that it is possible to make diagnosis and to prepare medication for a large number of diseases, such as diphtheria, lockjaw, hydrophobia, smallpox, tuberculosis, syphilis, and a host of others, and

WHEREAS, It has only been through the use of animals that we have been able to free ourselves of the scourge of childbed fever, thus to give the baby in arms to its mother, to free ourselves from typhoid fever, yellow fever and plague, and to develop methods for the reclaiming of our injured and maimed soldiers and other mutilated individuals, and

WHEREAS, Through the use of dogs especially, students can be adequately trained so that they do not meet their first patient without previous experience, and the skilled surgeon is enabled to devise immediately new methods of treating a rare kind of injury coming to his attention, and

WHEREAS, This use of animals is solely to obtain knowledge for the alleviation of human suffering, which knowledge surgeons and medical investigators have frequently furnished at the expense of their own lives, and

WHEREAS, it has come to our attention that for some time past the advancement of medical and scientific knowledge has been seriously hampered in St. Louis through the inability of our laboratories to obtain sufficient animal material, and

WHEREAS, We know that the animals in our laboratories are well cared for and humanely treated, therefore, be it

Resolved, By the St. Louis Medical Society that we do hereby endorse heartily the proposed ordinance now before the board of aldermen and respectfully urge its passage in the interests of humanity and of public health and safety in order that men can be properly trained for the practice of medicine; that we may advance our knowledge so as to bring under control diseases before which we are still practically helpless; and finally, in order to protect the fair name of our city, which is already regarded as one of the leading centers of medical learning in this country, a position it cannot hope to hold unless given unrestricted opportunity to advance.

Publicity on the part of the physicians was now under way. The campaign slogan, "Shall it be babies or dogs?" had been sounded a few days before in an address before the Women's Republican League of Missouri. The College Club, and the Civics Club passed resolutions favoring the bill, March 7. The St. Louis Surgeons Association, and the St. Louis Society of Internal Medicine each adopted resolutions favoring the bill. Copies of all these resolutions were sent to the mayor, members of the board of aldermen, and the newspapers during the week. The chamber of commerce, the Jewish Women's Council, the board of directors of the Negro Republican League, the St. Louis Association of Methodist Ministers, the president of the St. Louis Federation of Labor, and the president of the Catholic Women's League publicly favored the bill. The only society voting against it during this time was the St. Louis Branch of the American Medical Liberty League.

Committees called on prominent politicians, and the Public Welfare Committee of the board of aldermen visited Washington University to see the work at the school of medicine. They witnessed an operation on a dog, saw dogs that had been operated on, saw rats with cancers, and an operation on a boy in the general operating room, and were so interested that the chairman asked whether he might come again and bring other aldermen along. March 4, the St. Louis *Times* published a poll on the bill showing four aldermen in favor, five openly opposed, and eighteen waiting the public hearing before deciding. March 6, a prominent surgeon made a public address reviewing the history of surgery, and the relation of animal experimentation to its advance. The *Women's Home Companion* sent, on request, 1,000 copies of "The Truth About Vivisection"; the chairman of the committee for the protection of animal experimentation in Boston sent a large shipment of the third statement of that society. A small number of copies of the second article in the *Women's Home Companion* of November, 1921, was also obtained and distributed. At the public hearing, March 7, the aldermanic chamber of the city hall was packed an hour before the hearing began. About one fifth of those present were of the Humane Society. The cause of the medical schools was ably presented by the commissioner of health of St. Louis, the rabbi of the Temple Israel, a former solicitor-general of the United States, the acting president of St. Louis University, the pastor of the Second Presbyterian Church, the assistant secretary of the chamber of commerce, and the president of the Missouri State Medical Association; the other side was represented by the superintendent of the Humane Society, a director of the Humane Society, a statistician, a real estate operator, and the president of the Humane Society.

March 9, twenty aldermen again visited Washington University School of Medicine and not only saw animals which had been used for experimentation and operations in the hospital, but also visited a class in operative surgery. March 14, the Committee of Public Welfare voted unanimously in favor of the ordinance, which was then referred to the board of aldermen. Two newspapers published editorials favoring the bill. Opposing editorials did not appear in any paper, but a number of outspoken antivivisection letters appeared in the press during the period of publicity. March 31, a layman who had investigated the whole antivivisection society for a prominent journal spoke briefly to the aldermen at a recess which they granted. The president of the Missouri Humane Society replied to the speech before the aldermen. When the bill was brought up for vote just after these speeches, an alderman requested that it be postponed on the grounds that it dealt with matters that did not concern the aldermen, but the objection was defeated and a vote was called. The bill passed. Twenty-two aldermen voted yea and four nay. Two aldermen did not vote. The mayor signed the ordinance, April 19, and it will go in effect the latter part of May.

Miscellany

"THE SCIENTIFIC SIDE"*

"Nothing material is of value compared to philosophical knowledge of the next world and understanding of life in this which Spiritualism offers. My reputation, what title I have, what little money I possess, what slight literary prestige may be mine—all these are but as mud in the gutter in the illumination of the spiritual world, and I would gladly discard them all rather than lose the understanding my psychic researches have brought me."

AUDIENCE IS ELECTRIFIED

The speaker stood with upreared head as he shouted these words with all the fervor of an evangelist, and the tense audience, catching the fire of his glowing faith, seemed animated for an instant by an electric thrill. A thunder of applause broke out.

Time after time, as he cited circumstances of what he called indisputable cases of spiritual communication, he paused and cried in ringing voice: "If that is not a case of authentic contact with the next sphere, what is it? I have a right to ask that question." Each time a burst of applause signified the approval of his hearers.

. . . . . .

Sir Arthur's creed, stated simply, is this: Each human being possesses a spiritual body which is the exact counterpart of the physical body. Every feature, every lineament is the same. This spiritual body is a thing of substance, although beyond our comprehension as such. He characterized it as the "etheric body." This spiritual body inhabits its earthly home for its allotted time, which span is given us for development of the soul or spirit. In other words, terrestrial life is a space of time given us for "spiritualization," for fitting the spiritual body for its celestial life. When death overtakes the physical body, the etheric body escapes and rises to the next world, residing there in the plane to which it was developed while on earth, gradually ascending to higher and higher spheres.

"People who have clairvoyant powers are able to see the escape of the etheric body," he declared. "I have a record of one instance where there were eight daughters in one family who had clairvoyant vision. Their mother became ill and finally lay dying with her family around her. At the moment of death each daughter saw a burst of splendid lights, saw the figures of beckoning angels, and saw her mother's etheric body drift away in celestial company."

. . . . . .

Spiritual beings can communicate with terrestrials only through the aid of mediumistic powers, he said. The medium has the power to project from her body an aura or vapor in which the spiritual being can materialize. It is only when thus materialized that the spirit may converse with us, and during these periods there must be a compliance with the material laws of the earth.

"This projected vapor under favorable conditions can form itself into a solid substance," he went on, "a viscous putty-like substance that can pass through cloth without wetting it, and which immediately dissolves in light. The vapor is immediately dispersed in light, and the solid substance is only slightly less sensitive to this disturbance."

This solid substance is the ectoplasm, he said, and in its sensitiveness to light is much the same as the plate of a camera.

"One cannot develop a photographic plate in light, unless it is a dull red light, and the ectoplasm obeys this same law. It too can be seen only in red light or in the faintest of ordinary light."

With simple dramatic force Sir Arthur described his first experience in observing this ectoplasm, with Mlle. Eva, a French woman, as the medium.

ENCIRCLED HER BODY

"Mme. Bisson assisted Mlle. Eva in a cabinet in which I was present with other observers," he said. "Mlle. Eva was wrapped in a heavy rubber coat in order to protect her body from the light as much as possible. She entered into a trance, and after a short time an aperture was opened in the front of the rubber coat so that I could look within. I saw the ectoplasm in a thick, slimy band encircling her body like some monstrous worm.

"'May I touch it?' I asked Mme. Bisson.

"She replied, 'Yes.'

"I reached within the aperture and firmly grasped between thumb and forefinger the belt-like mass, and as I held it I felt it writhe—a living, pulsing substance."

Sir Arthur stated his belief that the medium would have died from shock had any attempt been made to remove this reputed ectoplasm, but the observers finally managed to pinch off a small portion, and this was hurried into a laboratory where Professor Richet of the University of Paris made a microscopic and chemical examination.

"It was found to consist of mucoid cells, epithelial cells, a clear, slimy fluid, certain carbonates, and other compounds. It was a sort of etherealized matter, if such a term may be employed.

He cited the circumstances of a number of seances, and in one case read testimonies of other observers who were present.

"In one instance, Mrs. Wriedt of Detroit, an American medium of great power, came to my house and we held a séance in the nursery, a room certainly devoid of suspicious surroundings. My wife and I, Mrs. Wriedt, and my secretary, Major Wood, held hands as we sat around a table, and having learned the value of singing in such experiments, we all sang softly in chorus. We knew the words of the hymn 'Onward, Christian Soldiers,' and by common consent took up this air. Suddenly there burst out overhead a clear joyous baritone voice, singing with us word for word. I stopped and heard the voices of my wife, of Mrs. Wriedt, and of Major Wood. And above them all was this ringing baritone voice.

SPIRIT VOICE WAS SINGING

"If that isn't a spiritual phenomenon, what is it?" he cried. "I have a right to ask that question."

He narrated details of numerous other séances, of one in which he declared he saw the face of his dead mother, "as plain as a Rembrandt portrait emerging from the dark," every wrinkle and line as he had seen her last.

"Again," he said, "I went to Southsea, where a Welch miner was staying." This was the medium Evan Powell.

"In this séance there were four other observers besides myself. Powell sat in my room in a chair and asked me to tie him in place. So well did I tie him that we had to cut him out after. Then he fell into a trance, and suddenly I became aware of dazzling celestial lights over his head. Then my son's voice cried out: 'Father, father.' The voice was not a yard from my face.

"Yes, my boy," I answered. "Yes, what is it?"

"'Father! Pardon!' he said, and I felt his hand on the top of my head, bowing down my head, and then felt his lips touch my forehead.

"I knew what he meant immediately. Only I could have known. He had never subscribed to my belief while alive, and now he had come back to tell me that it had been as I said.

"'Yes, my son,' I called back to him, 'you had a right to your own belief while here with us.'"

Again the speaker, wrought up to a high pitch, cried:

"If that isn't spiritual communication, what is it?" And the audience, listening intently to every word, broke out in a clatter of applause.

* From report of a lecture by Sir Arthur Conan Doyle, New York *Post*, April 13, 1922.

INVESTIGATION OF MUNICIPAL HEALTH DEPARTMENTS

The committee appointed by the American Public Health Association to investigate the practice of municipal health departments has issued its report (*Am. J. Pub. Health* **12**, January and February, 1922). This committee, which included Prof. C. E. A. Winslow, chairman, New Haven, Conn.; Dr. Charles V. Chapin, Providence, R. I.; Dr. Wade H. Frost, Washington, D. C.; Dr. Donald B. Armstrong, Framingham, Mass.; Dr. Allen W. Freeman, Baltimore; Dr. Louis I. Dublin, New York, secretary, and Dr. Lewis H. Thompson, U. S. Public Health Service, obtained information in all cases by having a representative of the committee visit each city. Eighty-three cities of more than 100,000 population were covered by the study. It was found that chlorin is employed

for purification of city water in fifty-one out of seventy-six cities reporting. The average daily consumption of water varies from 52 gallons per capita in Fall River, Mass., to 259 gallons per capita in Chicago. Bacteriologic examinations of water are made daily or oftener in fifty-two out of the sixty-eight cities reporting. Fifty cities discharge their sewage into rivers, eight into lakes, and twenty into the ocean, and in fifty-nine instances the sewage is discharged untreated.

MILK SUPPLY

Forty-six cities have milk commissions, and in thirty-nine, tuberculin testing is required of all herds from which raw milk is sold. Pasteurization of milk, except that from tuberculin-tested herds, is required in thirty-eight cities, the holding system being required in all but twenty; a temperature of 145 F. for thirty minutes is most commonly used. The average daily consumption of milk in sixty-eight cities was 0.66 pint per capita. Cities of 500,000 people or more use milk on the average from 858 farms, making proper supervision at the source of supply a difficult matter; seventeen cities make physical examinations of milk handlers, and twenty-four have routine procedures for the detection of disease carriers; "the completeness with which these ends are attained is, however, dubious."

PUBLIC HEALTH LABORATORY

Every city investigated had some sort of public health laboratory examinations; five had no municipal laboratory, and had the work done by contract with private laboratories or hospitals. The average number of examinations made was 86 per thousand persons, with an average cost for each specimen of 43 cents. A full-time chief of the laboratory service in cities over 500,000 received an average of $4,016 a year, and in cities with less than 250,000 population, $2,496 a year. The average staff required for making 100,000 examinations was 8.3 bacteriologists, 2.3 chemists, and 16.1 other persons (technicians, clerks, and the like).

PUBLIC HEALTH NURSING

Pubic health nursing service of some sort is available in all the cities studied. There was an average of 16.5 public health nurses per hundred thousand population; one supervisor was provided for about every 12.5 nurses. Medical inspection of children in public schools is done in all of the eighty-three cities except Dallas, Texas. Medical inspection of children in parochial schools is done in thirty-nine cities; in thirty-four by the health department, and in five by the board of education. Venereal diseases are reportable in all cities studied except Washington, in every case under state law, sometimes supplemented by local ordinance. A total of 61,758 cases of syphilis and 58,074 cases of gonorrhea was reported in sixty-two cities in 1920, an incidence of 270 and 253 cases per hundred thousand persons, respectively.

VENEREAL AND CONTAGIOUS DISEASES

Venereal clinics are in operation in eighty-two cities; Somerville, Mass., alone reported no clinic. Treatment is generally free, but in eighteen instances a nominal charge where possible was made. Seventy-six cities have tuberculosis clinics, but the reporting of cases of tuberculosis is still exceedingly lax. Seventy-nine cities have antispitting ordinances, but only twelve reported arrests. Smallpox and chickenpox are the only two diseases the diagnosis of which are commonly verified by the health department; seventy-three cities, it is surprising to say, still practice terminal fumigation, but many cities fail to use available cultural methods for the control of contacts.

EXPENDITURES

The gross expenditure of municipal health departments ranged from 21.6 cents to $3.18 per capita, 82 per cent. of which was expended in salaries. The health officer is appointed by the mayor in twenty-eight of the seventy-two cities reporting, directly by the council in seven, and by civil service in one. Forty-eight of the cities studied require the health officer to be a physician. Sixty-four health officers were doctors of medicine; four had the degree of Doctor of Public Health, three had law degrees, and two had engineering degrees.

Book Notices

THE INTESTINAL PROTOZOA OF MAN. By Clifford Dobell, M.A., F.R.S., Protistologist to the Medical Research Council, National Institute for Medical Research, London, and F. W. O'Connor, M.R.C.S., L.R.C.P., D.T.M. & H., Wandsworth Scholar, London School of Tropical Medicine. Cloth. Price, 15 shillings. Pp. 211, with 8 illustrations. London: John Bale, Sons & Danielsson, Ltd., 1921.

Readers conversant with the work on the protozoa parasitic in the human intestine accomplished by these authors during the World War will open this book with anticipation, and they will not be disappointed. The combination of these two men, masters, respectively, of the fields of zoology and of medicine, has worked out admirably; whether or not one agrees with all the details of the work, one cannot overlook the effectiveness and thoroughness of the treatment accorded the various topics. After a general opening chapter, each of the different groups of intestinal protozoa is considered separately, and then the diagnosis and treatment of intestinal protozoal infections, each in its own chapter, while finally the coprozoic protozoa of human feces are given detailed consideration. This chapter is as valuable as it is new, for many protozoa which are coprozoic come in one way or another to be interpreted as entozoic, and much confusion has been incorporated into various works by reason of the failure to differentiate sharply between these two groups of radically different habit. An extensive and carefully prepared list of original references is included, and the illustrations, several of which are colored, display fine workmanship in delineation and good results in reproduction. In the discussion of the different species, each form is taken up historically, with a list of synonyms and a correlated discussion of the earlier writings. It is then described with great care, both in the living condition and after preservation and staining. The important cystic condition receives special attention, and all other information available concerning methods of reproduction and of artificial cultivation of the species are included. The treatment accorded the work of other observers, though generally judicious, is occasionally marred by incautious criticism, such as that bestowed on Kofoid because he describes certain structures which these authors think are too minute to be probable, and on Boyd, whose description of cysts in *Chilomastix mesnili* certainly deserves credence. A careful perusal of the work will prove of value to investigators in this field, and a thorough study of its contents will form an admirable foundation for those who desire to inform themselves either theoretically or practically concerning the intestinal protozoa of man.

THE FLUTTER OF THE GOLDLEAF, AND OTHER PLAYS. By Olive Tilford Dargan, and Frederick Peterson. Cloth. Price, $1.50. Pp. 114. New York: Charles Scribner's Sons, 1922.

Dr. Peterson, well known as a psychiatrist, contributes a play to this book and collaborates in two others. The remaining play is by Mrs. Dargan. "The Flutter of the Gold Leaf," the first play, is a plea for more sympathetic understanding of the incipient mental defective. The concluding sketch by Dr. Peterson deals with psychotherapy. The title play would appear to be favorable for production by some of the numerous organizations now presenting one-act plays throughout the country. The others seem to lend themselves more suitably to reading than to presentation. It is stimulating to find a physician with the literary accomplishment displayed by Dr. Peterson.

DIE DIATHERMIE. Von Dr. Josef Kowarschik, Primararzt und Vorstand des Institutes für Physikalische Therapie im Kaiser-Jubiläums-Spital der Stadt Wien. Third edition. Paper. Price, 228 marks. Pp. 166, 89 illustrations. Berlin: Julius Springer, 1921.

This is an improvement over the second edition. In the theoretical part, all the discussions of high frequency currents that were too technical to be of interest to the medical man have been omitted. A concise and popular explanation of the electron theory, as far as it applies to high frequency currents, has been added. The description of the apparatus for medical diathermy is brought up to the modern development

of these appliances. A welcome addition is also a detailed discussion of the technic of administering the high frequency currents to the various parts of the human body. Particularly welcome to the tyro in this therapy will be an explanation of disturbances in the electric apparatus and how to avoid them, and, if occurring, how to remedy them. All the experiences of recent years were employed in fixing the indications for medical diathermy. The book as a whole lays stress primarily on medical diathermy, while the chapters on electrocoagulation, or surgical diathermy, are presented more in the form of an abstract.

Medicolegal

Physician's Report Not Enough to Sustain an Award

(Stimal v. Jewett & Co. et al. (N. Y.), 190 N. Y. Supp. 889)

The Supreme Court of New York, Appellate Division, Third Department, in reversing an award of the state industrial commission in these proceedings under the workmen's compensation law, says that, when the last hearing was had before the commission, it announced that it would ask the claimant to appear before a certain physician for examination; and the case was continued. About a month thereafter, the physician made a report to the commission, and it was evident that his report formed the basis of the determination that there was a loss of the use of one-third of the hand. Apparently the report was not submitted at any hearing of which the employer and the insurance company or carrier were notified. The physician did not appear for examination, and there was no opportunity to cross-examine him. The award, therefore, stood on the physician's unsworn statement, which was received outside of any regular hearing. The law contemplates that the employer and the insurance carrier shall be notified of the hearing and participate therein, and the receipt of this report, under the circumstances, was prejudicial to the employer and the insurance carrier, and called for a reversal of the award.

Sheriff Too Zealous in Enforcing a Quarantine

(Archbold et al. v. Huntington, Sheriff (Idaho), 201 Pac. R. 1041)

The Supreme Court of Idaho affirms a judgment against the defendant, to the effect that he should be deprived of his office as sheriff, and in favor of the informants for $500 and costs, because after he had arrested the complainants on a warrant, in November, 1918, he wrongfully kept them in jail, as a matter of quarantine. The court says it appeared that two of the county commissioners, one being a physician, and he, with the other members, having at some former time designated himself as county health officer, made some effort or took some steps toward establishing a quarantine district, to prevent the introduction of the Spanish influenza, and thereby attempted to prohibit all persons from entering the quarantine district, unless first detained in quarantine for such time as the health officer should determine was necessary. But it was clear from the record that a quarantine district was not established. The complaint on which the warrant of arrest was issued charged the complainants in this case with the crime of having wilfully violated quarantine regulations, and the warrant issued thereon commanded the defendant sheriff forthwith to arrest them and bring them before the probate court that issued the warrant, or before some other magistrate. This warrant of arrest was regular in form, and issued by a court of competent jurisdiction, and was sufficient to protect the sheriff in its due execution, if he had complied with its requirements. But he failed to take the complainants before the probate court or any magistrate, as the writ commanded and they requested him to do. Instead, he put them in the county jail, to hold them, as he testified, until their quarantine period was up; and he was ever willing, he averred, to take them before the probate court and to permit them to go where they pleased, after being detained and quarantined the length of time required by the rules and regulations established in that county.

It might be, the court goes on to say, that the defendant and the physician, the county health board officer, acted under a mistaken notion that it was within their authority to arrest and place in jail all persons who entered this pretended quarantine district, but, however that might be, it could not be urged even as an extenuating circumstance, much less as a defense, on behalf of the defendant. He contumaceously refused to obey the order of the court, and, acting either on his own volition or on the direction of the health officer, placed the complainants in jail for what he or the health officer determined was the proper quarantine period for which they should be held. Manifestly, ministerial officers cannot usurp the functions of courts in this manner, and escape the consequences of their wrongful acts.

In a dissenting opinion it is stated that from the record it clearly appeared that the people, particularly in and about Challis, were panic-stricken, even to the extent that they barricaded themselves against officers of the federal and state government entering the town. Their wire entanglements quite equaled, if they did not surpass, those constructed by the powers opposed to the allies during the great war. While this condition was at its height, the complainants entered the restricted district, and a warrant was placed in the hands of the defendant, as sheriff, to apprehend them. His conduct was not such as should receive commendation at the hands of this or any other court, yet it is not thought that the judgment should be sustained.

Injury and Preexisting Disease Under Workmen's Compensation Act

(Springfield District Coal Mining Co. v. Industrial Commission et al. (Ill.), 132 N. E. R. 752. Rockford Hotel Co. v. Industrial Commission et al. (Ill.), 132 N. E. R. 759

The Supreme Court of Illinois says, in the first case, that an employee is entitled by the Illinois statute to be compensated for every accidental injury suffered in the course of his employment and arising out of the employment. If an injury sustained is the proximate cause of the incapacity for which compensation is sought, the previous physical condition of the employee is unimportant, and he may recover for permanent incapacity which results from an accident independent of preexisiting disease. He is not entitled to compensation for a condition resulting from a preexisting disease and not from an injury suffered in the course of employment and arising out of it. If there is a preexisting disease, the employee is entitled to recover for all the consequences attributable to the injury in the acceleration or aggravation of such disease. Such aggravation or acceleration, permanent and progressive in its nature, will entitle the employee to compensation to the extent and in the proportion in which the preexisting disease is increased or aggravated. Mere predisposing physical condition does not affect the right to compensation. If an accident results in a lesion or a new condition of which it is the proximate cause, there may be a recovery of compensation for the same, regardless of predisposing conditions making the employee more susceptible to the injury. Under these rules, the previous condition of the employee in this instance, who had myocarditis before he was injured, was a material circumstance to be considered in ascertaining whether his condition of total and permanent disability resulted from the accident suffered in the course of his employment and arising out of it, or from the disease, and, if from both, the proportion in which the accident contributed; for the proper ascertainment of which, the case is remanded.

In the second case, an employee who had some disease, mild in form, that caused spasms or fits of not very frequent occurrence, fell into an ash pit, was badly burned, and died about three months later. The industrial commission made an award to his widow, but a court set it aside. In reversing the judgment of the court, and directing that it confirm the award, the Supreme Court of Illinois says that some courts hold that, when an employee is seized with a fit and falls to his death, the employer is not liable, because the injury did not arise out of the employment; but a majority of the courts, American and English, hold that, if the injury was due to the fall, the employer is liable, even though the fall was caused by a preexisting idiopathic condition. This employee did not die from epilepsy or a preexisting disease, but from the burns he received from falling into the pit.

Society Proceedings

COMING MEETINGS

AMERICAN MEDICAL ASSOCIATION, St. Louis, May 22-26. Dr. Alex. R. Craig, 535 N. Dearborn St., Chicago, Secretary.

American Association for the Study of the Feebleminded, St. Louis, May 18-20. Dr. R. W. Baker, Laconia, N. H., Secretary.
American Association of Anesthetists, St. Louis, May 22-24. Dr. F. H. McMechan, Avon Lake, Ohio, Secretary.
American Association of Industrial Physicians and Surgeons, St. Louis, May 22-23. Dr. W. A. Sawyer, 343 State St., Rochester, N. Y., Sec'y.
American Proctologic Society, St. Louis, May 22. Dr. Ralph W. Jackson, 245 Cherry St., Fall River, Mass., Secretary.
American Psychiatric Association, Quebec, Canada, June 6-9. Dr. C. Floyd Haviland, Middletown, Conn., Secretary.
Arkansas Medical Society, Little Rock, May 17-19. Dr. William R. Bathurst, 810 Boyle Building, Little Rock, Secretary.
Association for the Study of Internal Secretions, St. Louis, May 22. Dr. F. M. Pottenger, Title Insurance Bldg., Los Angeles, Secretary.
California, Medical Society of the State of, Yosemite, May 15-18. Dr. W. E. Musgrave, Butler Bldg., San Francisco, Secretary.
Connecticut State Medical Society, Bridgeport, May 17-18. Dr. C. W. Comfort, Jr., 27 Elm Street, New Haven, Secretary.
Florida Medical Association, Havana, Cuba, June 30. Dr. Graham E. Henson, Jacksonville, Secretary.
Illinois State Medical Society, Chicago, May 16-18. Dr. W. H. Gilmore, Mount Vernon, Secretary.
Iowa State Medical Society, Des Moines, May 10-12. Dr. T. B. Throckmorton, Bankers' Trust Bldg., Des Moines, Secretary.
Maine Medical Association, Portland, June 27-28. Dr. B. L. Bryant, 265 Hammond St., Bangor, Secretary.
Massachusetts Medical Society, Boston, June 13-14. Dr. W. L. Burrage, 42 Eliot St., Jamaica Plain, Boston, Secretary.
Medical Library Association, St. Louis, May 22-23. Dr. John Ruhräh, 1211 Cathedral St., Baltimore, Secretary.
Michigan State Medical Society, Flint, June 7-9. Dr. F. C. Warnshuis, 410 Powers Bldg., Grand Rapids, Secretary.
Mississippi State Medical Association, Hazlehurst, May 9-10. Dr. T. M. Dye, Clarksdale, Secretary.
New Hampshire Medical Society, Concord, May 17-18. Dr. D. E. Sullivan, 7 North State Street, Concord, Secretary.
New Jersey, Medical Society of, Spring Lake, June 20-22. Dr. William J. Chandler, South Orange, Secretary.
North Dakota State Medical Association, Jamestown, June 1-2. Dr. H. J. Rowe, Lisbon, Secretary.
Oklahoma State Medical Association, Oklahoma City, May 9-11. Dr. C. A. Thompson, 508 Barnes Bldg., Muskogee, Secretary.
Radiological Society of North America, St. Louis, May 19-20. Dr. M. J. Sandborn, Appleton, Wis., Secretary.
Rhode Island Medical Society, Providence, June 1. Dr. I. W. Leech, 111 Broad St., Providence, Secretary.
South Dakota State Medical Association, Huron, May 16-18. Dr. R. D. Alway, 423 S. Lincoln St., Aberdeen, Secretary.
Texas, State Medical Association of, El Paso, May 9-11. Dr. H. Taylor, Texas State Bank Bldg., Fort Worth, Secretary.
West Virginia State Medical Association, Huntington, May 17-19. Dr. Robert A. Ashworth, Moundsville, Secretary.
Wyoming State Medical Society, Sheridan, June 20-21. Dr. Earl Whedon, Sheridan, Secretary.

MEDICAL SOCIETY OF THE STATE OF NEW YORK

One Hundred and Sixteenth Annual Meeting, held in Albany, April 18-20, 1922

The President, DR. JAMES F. ROONEY, Albany, in the Chair

Address on Surgery

DR. JOHN B. DEAVER, Philadelphia: In the development of surgery, animal experimentation has done more than anything else to widen the boundaries of our knowledge by substituting for vague theories more exact knowledge and refined methods of procedure. This spirit of investigation should be encouraged. Equally essential for surgical diagnosis and treatment are the researches in the field of bacteriology, chemistry, physics and biochemistry. However, we are in danger of losing the advantage of the highly trained senses which our ancestors developed and which enabled them to detect obscure signs. There is too great a tendency on the part of the youthful diagnostician to neglect the development of the five senses and to rely too exclusively on more or less mechanical methods of diagnosis. Closer contact with the anatomist, the physiologist, the pathologist, the pharmacologist and the biochemist is essential. Operative mortality has been reduced to a minimum in a large class of cases. Not a little of the reduction is due to improvement in methods of administering general anesthetics and the institution of local anesthesia. Another factor in the improvement of operative mortality is rapidity of operation, the quickest maneuvers and minimum of manipulation consistent with exact and careful work. The personal equation of the operator is a vital factor in successful surgery today. Postoperative methods have undergone a change. An erroneous impression that is being rapidly corrected is that functional rest is an essential factor in postoperative treatment. Today the wound is allowed to heal with the minimum interference and the maximum of rest. But with regard to function, our efforts take the opposite course. Observation seems to show that wounds of those parts of the body subject to the most constant and unavoidable activity heal more smoothly and rapidly than elsewhere. In the treatment of sprains, dislocations and fractures, instead of prolonged bandaging and rest, we encourage wherever possible early activity of the muscles, and passive and active movement of operated joints, so that by the time the union of bone has taken place the muscles and joints are in a more or less normal condition. To avoid postoperative adhesions and to obtain the necessary freedom of respiration we make our patients assume a semisitting position as early as the second day after operation.

Treatment of Anthrax by the Local and General Administration of Anthrax Serum

DR. JOSEPH C. REEGAN, Brooklyn: The measures of local therapy of anthrax in common use should be abandoned. As cutaneous anthrax in man is primarily a local infection, with a characteristic tendency to remain as such in a high proportion of cases, no method of treatment is warranted which breaks down the barrier zone to the inflammatory process which nature has so carefully and characteristically constructed. The mortality from malignant pustule can no doubt be reduced to a minimum by early recognition and prompt serum treatment. The serum should be administered both by local injection around the lesion, and, generally, into the circulation by the subcutaneous, intramuscular and intravenous routes. The dosage, freqency of injection, and route used necessarily depend on the location and severity of the lesion, the presence or absence of an anthrax septicemia, and, to a lesser extent, on the degree of the constitutional symptoms. The method that seems most successful is that of administering 10 c.c. by local infiltration, every eight hours, and 40 c.c. intravenously every four hours. The local injection of serum around the lesion is a most desirable method to replace the local measures previously utilized.

Sequels of Epidemic (Lethargic) Encephalitis and Their Treatment

DR. LEWELLYS F. BARKER, Baltimore: In epidemic encephalitis, complete recovery is the exception rather than the rule. Perhaps 75 per cent. of the cases exhibit residual phenomena that are more or less serious; hence a guarded prognosis should always be given. A great variety of postencephalitis syndromes have come to observation and description. In motor domains they include hyperkinetic phenomena (myoclonic, choreatic, atheototic, convulsive). Extrapyramidal motor disturbances also have been especially prevalent. In the sensory domain, anesthetic, hyperesthetic and paresthetic syndromes are described. Disturbances of coordination have not been uncommon. Furthermore, many autonomic disturbances have been noted. Perhaps, most common of all sequels have been certain postencephalitic disturbances of the psyche in the form of character, cognitive, affective or conative disorders. A parkinsonian syndrome is a frequent postencephalitic sequel, doubtless because of the predilection of the virus for the corpus striatum, especially the globus pallidus. Particularly common are certain pupillary and ciliary disturbances. Sialorrhea with constant spitting is frequently encountered; xorostomia is less common. Among the nutritional disturbances reported, rapidly developing obesity seems to be the most common. The mental disturbances are "toxic infectious psychoses." A considerable number of children are rendered permanently deficient mentally; even in adults there may be loss of memory and judgment. The psychotic and psychoneurotic manifestations following epidemic encephalitis are various minor and major psychoses.

Use of the Schick Test and Diphtheria Toxin-Antitoxin Mixture in New York City Schools

DR. WILLIAM H. PARK, New York: From 85 to 100 per cent. of nonimmune children became immune to diphtheria

after the first series of toxin-antitoxin injections. There are great variations in the results of immunizing injections with the same strength and preparation of toxin-antitoxin. In retesting children who have had one series of injections, the discrepancies varied all the way from 75 to 80 per cent. of successful immunizations in some schools to from 25 to 30 per cent. in other schools. It was found that the percentage of those becoming immune after receiving one series of injections of toxin-antitoxin was in inverse proportion to the percentage of positive reactions following the original Schick test. When the number of positive Schick tests was high, the number of children becoming immune after one series of injections was low. The reverse is likewise true. It was found that the children in the schools in the poorer sections of the city gave fewer positive reactions to the Schick test and responded to the toxin-antitoxin injections with a higher percentage of immunes than the children in the better sections of the city among the well-to-do. We have obtained as high as from 60 to 70 per cent. of positive Schick reactions with the original test in schools located in certain sections among the better classes, while in schools in crowded sections of the city, only from 15 to 20 per cent. gave positive Schick tests. The explanation is that the children in the poorer sections are often exposed to mild doses of diphtheria organisms which bring about a certain degree of natural immunity. Among the children of the better classes this exposure is not present, and they therefore remain susceptible. We have seen no harmful effects from the application of the Schick test and toxin-antitoxin injections in more than 100,000 schoolchildren. In order to bring about an immune child population it is necessary to begin early and to immunize all children from 1 to 5 years of age, as 85 per cent. of the cases of diphtheria occur among this group. The injection of toxin-antitoxin in the new-born brings about very little immunity; the injections are effective, however, after the child reaches the age of 6 months.

Circulatory Functional Tests and Their Significance

DR. WILLIAM W. HERRICK, New York: In applying the exercise test, the work performed should make a genuine demand on the subject's capability. The pulse rate is counted after the subject has been quietly seated for a few minutes, immediately after exercise, and again after two minutes' rest. In the absence of disease of the lungs or gross disease elsewhere or of fatigue, the pulse rate in the young individual in good physical trim after 100 hops should not be accelerated more than twenty beats a minute; two minutes after stopping exercise it should be within from five to ten beats of the previous resting rate. Dyspnea should not be marked. Modified to meet the individual needs of the patient or physician, this test is the most practical of all for the practitioner. The ideal test of circulatory function should take account of all possible factors. It should include the resting pulse rate, the standing pulse rate, and the rate after exercise and after a change in posture, and such respiratory factors as the vital capacity, the minute volume of pulmonary ventilation, the pressure gradient of carbon dioxid in the blood entering and leaving the lungs, the basal metabolism rate and the electrocardiogram. Such elusive factors as neuromuscular fatigue, psychic states and endocrine balance are to most of us imponderables of weight, but not weighable. Should a higher degree of precision be desired, Schneider's system of rating is to be recommended. The special student may go further and may adopt any or all of the more elaborate methods.

Renal Tests

DR. JOHN R. WILLIAMS, Rochester: The most valuable renal tests are, first, those developed by Mosenthal, the specific gravity and fixation tests. The tests of Myer, Fine and Chace are also of great value. The phenolsulphonephthalein method has a limited degree of usefulness, but none of these tests in themselves are sufficient. The clinical judgment as to the patency of the kidneys must rest on a study of the patient himself modified by renal findings. A single renal functional test is of very little value. Single tests done once or a number of times are not nearly as valuable as combinations of tests. In making functional renal tests it is advisable to use all the common tests and to follow those which give the most significant leads. If a subject develops kidney disease in such a manner that destruction or degeneration takes place slowly so that unaffected cells may compensate, he may go along comfortably for years; if the process comes on rapidly and the opportunity to compensate is not very good, serious phenomena are precipitated. In making functional tests, the best way to test the patient is under the conditions in which he lives at home, as suggested by Mosenthal.

Gastro-Intestinal Tests

DR. ABRAHAM H. AARON, Buffalo: Gastric subacidity is characterized by a low total and a free acid, rapidly emptying stomach, rapid disappearance of starch from the contents, and the small amount of contents secured by aspiration. Achylia gastrica is characterized by a total acidity rarely over 10, absence of free hydrochloric acid, absence of pepsin, rapid disappearance of starch, and a small amount of contents secured by aspiration. Hyperacidity is characterized by a high acid value, large amounts of stomach contents, and food retention, due to associated pylorospasm and separation of the contents into three layers. Pyloric obstruction due to ulcer, cicatricial tissue or extragastric pressure is characterized by high acid values, large amounts of contents, food retention and the three layer phenomenon. Carcinoma, nonobstructive, is usually characterized by subacidity, small amount of stomach contents, rapid starch disappearance and rapidly emptying stomach. Carcinoma, obstructive, is characterized usually by a subacidity or achlorhydria, large amounts of stomach contents, food retention and the three layer phenomenon. Fractional analysis has considerable distinctive value, but the single test meal method is more easily and rapidly performed, rendering valuable diagnostic facts, for which reason it must not be too hastily set aside or belittled. The fractional test is of outstanding value in determining a true achylia or subacid condition, and the actual emptying time of the viscus.

Transfusion of Blood of Immunized Donors in Bacteremia

DR. LESTER J. UNGER, New York: Biologic tests have demonstrated that the transfusion of unmodified blood is of far greater value than blood modified by the addition of sodium citrate. Since the complement and the phagocytic power of the blood are of great importance in the protective action against pathogenic organisms, unmodified blood from a donor with high phagocytic index should be employed when attempting to combat local or general infections by means of transfusion. We have endeavored to enhance the value of the donor's blood employed in cases of bacteremia by attempting to produce immunity in the donor. We start by giving the donor 100 million killed bacteria from the patient and increasing the dose up to 100 or 150 billion, giving daily injections. In this way we have demonstrated that the donors develop immune bodies. Since time is often an essential factor in cases of bacteremia, the patient is given a first transfusion from an appropriate nonimmunized donor, one whose phagocytic index is high. After the donor has received the vaccines for from seven to nine days, agglutination tests should be carried out before transfusion is performed to establish the fact that he has developed immune bodies.

Common Forms of Nervous Diseases

DR. EDWARD LIVINGSTON HUNT, New York: Epidemic encephalitis, together with multiple sclerosis and syphilis of the central nervous system, should be considered the three principal nervous diseases. Among the after-effects of epidemic encephalitis one may find the parkinsonian syndrome like that seen in paralysis agitans. I am of the opinion that this syndrome as seen in paralysis agitans and following epidemic encephalitis is identical. In epidemic encephalitis it may be interpreted by assuming that the infection enters certain parts of the brain, causing inflammation and later necrosis. From this it seems fair to assume that the parkinsonian syndrome should be regarded not as an entity but merely as a symptom resulting from a toxic cause or from bacterial invasion. In making a diagnosis of a neurologic condition syphilis should be placed at the head, and one should never reach a definite conclusion until syphilis has been excluded. Certain strains of spirochetes exercise elective action, and certain strains have an affinity for the central nervous system. Syphilis is a constitutional disease, and

the nervous system is affected very early. Treatment of neurosyphilis should be intravenous or intraspinal. When the intraspinal treatment can be avoided, it is best to do so. One should adminsister arsphenamin intravenously one day in the week, and on another day give mercury. In most cases in which arsphenamin is not tolerated, this is due to the fact that the dose is too large or that there has been a mistake in the technic. As tabetic patients advance in life, nature seems to set up an immunity against the syphilitic virus, so that they sometimes react negatively to the Wassermann test.

(To be continued)

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia

March, 1922, **163**, No. 3

*Relation of Aleukemic Leukemia, So-Called Pseudoleukemia and Malignant Granuloma. H. Fox and D. L. Farley, Philadelphia.—p. 313.
Heart in Infectious Disease. P. D. White, Boston.—p. 335.
*Diagnosis of Tumors of Cauda Equina, Conus and Epiconus Medullaris. H. L. Parker, Rochester, Minn.—p. 342.
*Erythropoietic Action, Cumulative Effect and Elimination of Germanium Dioxid. J. H. Müller and M. S. Iszard, Philadelphia.—p. 364.
*Latent Neurosyphilis in Eight Per Cent. of Medical Patients Ignored Owing to Neglect of Lumbar Puncture. H. Gray, Boston.—p. 384.
*Roentgen-Ray Stimulation of Pancreas in Experimental Pancreatic Deficiency. W. F. Petersen and C. C. Saelhof, Chicago.—p. 391.
Infectious Arthritis of Spine. S. Epstein, New York.—p. 401.
Obstruction of Superior Vena Cava by Primary Carcinoma of Lung. H. W. Dana, Boston and R. McIntosh, New York.—p. 411.
Endocrinal Factor in General Paresis. T. K. Davis, New York.—p. 425.
Chronic Lymphatic Leukemia Associated with Extensive Amyloiditis, Advanced Nephritis and Oral Sepsis. E. S. Du Bray, San Francisco.—p. 430.

Pseudoleukemia: Malignant Granuloma.—Fox and Farley record three cases, grouped by age, clinical course, physical appearance of patient and somewhat by the pathology, which were diagnosed as Hodgkin's disease at first, but by close clinical analysis and examination of excised glands were placed among the tumors and leukemias, or so-called pseudoleukemia. They illustrate how for many months they may not seriously disturb the patient's general health, leading to incorrect diagnosis, or temporization is practised until the entire lymphatic system is involved beyond reasonable expectation of good result. All three patients died from intercurrent acute infection after a short and rather stormy illness. Attention is called to the need for classification of the enlargement of lymphatic bodies and the hyperplasias of these and allied tissues in the absence of a definite increase in the circulating leukocytes. The two cases of aleukemic leukemia reported, while showing very extensive involvement of the lymphatic apparatus, had no reduction of circulating mononuclears. An excision of a lymph node for microscopic study is the only reliable method of making a decision as to diagnosis in lymphatic enlargements. It is valuable also from the standpoint of prognosis and treatment.

Diagnosis of Cauda Equina Tumors.—The combination of sphincter disturbance, atrophic paresis of the lower limbs and perianal anesthesia is characteristic of cauda equina tumors, but the determination of the position and extent of the tumor mass is in some cases an impossibility. Of the eight tumors reported on by Parker only two were encapsulated, and one was diagnosed by the pathologist as an endothelioma and the other a glioma. Five were tumors which showed a tendency to erode the dura, bone and muscle, approaching even to one inch of the skin. One was obviously a relatively benign tumor, but no pathologic diagnosis was made. The earliest, most constant and most distressing symptom in this disease is pain. Tenderness of the back was present in three cases. Rigidity of the lumbar spine was associated with marked tenderness in two cases. Seven patients were weak in their lower extremities. Five patients had difficulty in controlling the bladder. All the patients had some degree of sensory loss, but the degree varied from a slight loss of sensation, of which the patient was ignorant, to complete anesthesia of the lower extremities. The tendo Achillis reflex was absent or diminished in all the cases and the patellar reflexes were intact in only one case. The cutaneous reflexes were interfered with in a few cases and helped greatly to estimate the highest level in the cord or the greatest number of roots involved by the tumor. In two cases there was evidence of edema of the lower limbs.

Effect of Germanium Dioxid on Red Blood Cells.—Müller and Iszard germanium dioxid tested on the guinea-pig, rabbit, dog and man and found that it has a decided erythropoietic action. This erythropoietic action exerts a certain periodicity as shown in all of the erythrocyte curves obtained. Relatively large doses of germanium dioxid are distinctly toxic, and from the results obtained it can be estimated that the lethal dose is about 586 mg. per kilo of body weight. This toxic action is not explainable on the basis of the accumulation of the compound in the system but is possibly due to an overstimulation of the blood forming organs. A quantitative method was devised by the authors for the determination of germanium dioxid in animal tissues and excreta, both in the presence and absence of arsenic. Germanium dioxid does not accumulate but is eliminated through the kidneys and alimentary tract. The overdose being rapidly eliminated and occurring chiefly through the agency of the kidneys, elimination by way of the alimentary tract is small.

Lumbar Puncture Discloses Latent Neurosyphilis.—Among sixty-two patients with medical complaints not pointing to syphilis were eight cases in which the disease was unrecognized, in five among these eight the central nervous system was most gravely affected. Gray urges that lumbar puncture should be done (preferably after preliminary fundus examination) on every syphilitic. If postive, it should be repeated rather frequently, at least annually, until it has been negative for one year; and thereaffter every two years to exclude recurrence.

Effect of Roentgen Ray on Pancreas Deficiency.—Petersen and Saelhof investigated the possible effect which roentgen-ray stimulation of the pancreas might have on the carbohydrate tolerance of partially depancreatized dogs. They noted a transient increase in sugar output, then an increase in carbohydrate tolerance. This latter may occur without the preliminary increase in sugar excretion. The increased tolerance may be transient or may extend over a period of several weeks after irradiation. The increased tolerance is not due to the preliminary increase in sugar elimination. When increased sugar elimination is brought about by some other irritant (turpentine abscesses) no increase in carbohydrate tolerance is later observed. The effect on the blood sugar varies. Usually a temporary increase in the blood sugar can be determined, followed by a lowering of the level that takes place in from five hours to several days after the irradiation. When evidences of acidosis exist at the time of irradiation they may diminish or disappear with the improvement in the sugar tolerance. The effect of irradiation on the pancreas is due to direct stimulation of cellular metabolic processes and not due solely to alterations primarily vascular. This stimulation is merely an example of the Arndt-Schulz observation that cell irritants in small doses stimulate metabolic processes. When the irradiation is used in too large a dose, injury to the pancreatic function is apparent in a diminution in carbohydrate tolerance. When tissues other than those containing the pancreatic rest are irradiated no effect is observed on the carbohydrate tolerance other than the primary augmentation of sugar excretion. The titer of the serum diastases, which may be altered by irradiation of the liver, seems to be without influence on the tolerance.

Archives of Dermatology and Syphilology, Chicago

April, 1922, **5**, No. 4

*Vernes Reaction: Technic and Preliminary Experiences. L. H. Cornwall, New York.—p. 434.
Therapeutic Suggestions Regarding Treatment of Affections of Hands and Feet. E. W. Ruggles, Rochester, N. Y.—p. 462.
*Comparison of Formaldehyd-Gel Reaction of Gate and Papacostas with Wassermann Reaction. V. Burke, San Francisco.—p. 469.
*Rhinoscleroma. V. Pardo-Castello and M. M. Dominguez, Havana, Cuba.—p. 480.

*Hypersensitiveness to Local Contact with Arsphenamin Producing Chronic Eczematoid Dermatitis and Asthmatic Symptoms. J. V. Klauder, Philadelphia.—p. 487.

Vernes Reaction.—The Vernes reaction is discussed in detail by Cornwall and it is compared with the Wassermann test. It would appear that, in cases of syphilis under treatment, the spinal fluid gives positive reactions with the Vernes test in about 12 per cent. more cases than with the Wassermann test. On the other hand, the series studied by Cornwall would indicate that, on a single examination of the blood of persons suffering from syphilis and under treatment, the Wassermann reaction is positive in about 19 per cent. more cases than the Vernes reaction. This brings up the point as to the relative value of the two tests and suggests the question as to whether a negative Wassermann reaction in the blood must necessarily accompany the clinical cure of syphilis. The chief value of the Vernes test lies, not in a single application to a given case, but in the graphic record secured from periodic examinations. The value of this procedure cannot be gaged by its comparison with Wassermann results, but by its application to clinical and pathologic observations.

Value of Formaldehyd-Gel Test for Syphilis.—The formaldehyd-gel test, Burke claims, is not so reliable a test for syphilis as the Wassermann test made with a cholesterinized antigen and water bath incubation, nor is it quite so reliable as the Wassermann test with an alcoholic extract antigen. The formaldehyd-gel test gives results in closer agreement with the negative than with the positive Wassermann tests. When the two tests disagree, a positive formaldehyd-gel diagnosis will be found to be correct in an undetermined percentage of cases; a negative formaldehyd-gel diagnosis will rarely be correct. The substance on which the formaldehyd-gel reaction depends is not present in the spinal fluid of syphilitic patients, or at least not in sufficient amounts to cause coagulation on the addition of formaldehyd. Suggestions are given for the interpretation of results obtained with the formaldehyd-gel test and for future research.

Rhinoscleroma in Cuba.—Pardo-Castello and Dominguez report the first case of rhinoscleroma that has occurred, so far as they know, in Cuba, in a person who had never been abroad. The microscopic examination of the tissue proved it to be a typical granuloma, with the occurrence of vacuolated cells of Mikulicz and plasma cells in hyaline degeneration, characteristic of rhinoscleroma. The bacteriologic study demonstrated the presence, in the cells, of a germ, which was recovered from the cells in pure cultures, and which, from its biologic characteristics, belonged to the group of *B. lactis-aerogenes*. Cultures of this germ produced an intense febrile reaction and inflammation when injected into guinea-pigs, but failed to reproduce rhinoscleroma. The germ did not resemble at all the bacillus described by Frisch as the etiologic agent of this disease.

Dermatitis and Asthmatic Symptoms Caused by Local Contact with Arsphenamin.—A case of chronic dermatitis and respiratory symptoms due to external contact with the arsphenamins is reported by Klauder. The patient was a physician. An erythematous scaly eruption was present with fissuring involving the index and second fingers of the right hand and index and second and third fingers of the left hand. The involved areas itched, as did also the hands and fingers on which there was no cutaneous manifestation. At times an eczematoid eruption appeared on the face. The patient said that the dermatitis might possibly be due to contact with neo-arsphenamin since he noticed the eruption was aggravated after administering this drug. His suspicions were substantiated by the observation that when opening an ampule of neo-arsphenamin and dissolving it, he frequently sneezed and coughed and was conscious of a sense of pressure and constriction in his chest. At other times a definite attack of asthma was experienced. The patient was advised not to prepare the arsphenamin for administration, to wear rubber gloves when injecting it and to exercise great care that none of the solution came in contact with his hands. He has been free of all symptoms for more than a year, since this advice was carried out, although he is administering these drugs almost daily.

Archives of Internal Medicine, Chicago

April, 1922, **29**, No. 4

*Paroxysms of Tachycardia. H. M. Marvin and P. D. White, Boston.—p. 403.
*Renal Glycosuria. D. S. Lewis, Montreal, Can.—p. 418.
*Chemical Studies of Blood and Urine of Syphilitic Patients Under Arsphenamin Treatment. C. Weiss and A. Corson, Philadelphia.—p. 428.
*Studies in Variation of Lenth of Q-R-S-T Interval. G. K. Fenn, Chicago Heights, Ill.—p. 441.
*Postoperative Pulmonary Complications. E. C. Cutler and A. M. Hunt, Boston.—p. 449.
Pathology of Cirrhosis of Liver. F. Epplen, Spokane.—p. 482.
*Antidiuretic Effect of Pituitary Extract Applied Intranasally in Case of Diabetes Insipidus. H. L. Blumgart, Boston.—p. 508.
Vital Capacity in Group of College Students. A. W. Hewlett and N. R. Jackson, San Francisco.—p. 515.
*Length of Life of Transfused Erythrocytes in Patients with Primary and Secondary Anemia. J. T. Wearn, S. Warren and O. Ames, Boston.—p. 527.
Blood Pressure and Pulse Rate Levels. T. Addis, San Francisco.—p. 539.

Paroxysms of Tachycardia.—In a series of 250 cases with cardiac symptoms or with signs of heart disease discussed by Marvin and White, there were fifteen cases of paroxysmal auricular tachycardia, seventeen cases of paroxysmal auricular fibrillation, eighteen cases of permanent auricular fibrillation, and four cases of paroxysmal flutter. One of the cases of paroxysmal flutter showed also on occasion the coarse type of paroxysmal fibrillation, and is included in both groups. The total number of patients with auricular fibrillation in this group is thirty-five, and seventeen of these showed the transient form. Eleven of the seventeen patients with paroxysmal auricular fibrillation were more than 50 years of age (eight were past 60 years). It is evident from this study that paroxysmal auricular fibrillation is a common type of paroxysms of tachycardia, and is seen in practice as frequently as paroxysmal auricular tachycardia, and is seen in practice as frequently as paroxysmal auricular tachycardia and permanent auricular fibrillation. It is found most frequently in old age, the result of cardiosclerosis; also in rheumatic and thyroid hearts, in acute pericarditis, severe acute infections, and following the use of digitalis. Paroxysms of tachycardia may occur at frequent intervals for years without incapacitating the subject and without increasing the degree of cardiac damage appreciably. Paroxysmal tachycardia of ventricular origin is very rare. Another case is added to the ten undoubted cases already reported. Electrocardiographic study is essential in the accurate diagnosis of ventricular paroxysmal tachycardia, and even with electrocardiograms the condition must be differentiated from auricular paroxysmal tachycardia with bundle branch block. Ventricular ectopic beats may occur in auricular paroxysmal tachycardia without disturbing the dominant rhythm. Rarely, alternation of the Q R S complexes of the electrocardiogram may be found in paroxysmal tachycardia. (Alternation of the radial pulse in this condition is common.)

Renal Glycosuria.—A further note is recorded by Lewis on a case reported in 1915 and studies of two other instances are presented in some detail. The first patient, after six years of observation, still presents a marked glycosuria without symptoms and with a normal amount of sugar in the blood. He is apparently in excellent health. The second is a severe case of chronic diffuse nephritis, in which a glycosuria has been practically continuous since its onset twelve months ago. It is small in amount, the largest quantity being 16 gm.; it is largely independent of the carbohydrate intake, it required three days' starvation before its disappearance, and reappeared on an intake of 30 gm. carbohydrate as green vegetables. The amount of glucose does not show any constant relation to the urinary volume. Synchronous sugar determination on blood and urine show the presence of a glycosuria with 0.068 per cent. sugar in the blood. The response to 100 gm. glucose falls within the limits of a nondiabetic case of nephritis. There are no other signs of a diabetes mellitus. The third patient, aged 74, has a marked arteriosclerosis (arteriosclerotic kidney), and was first seen on account of scurvy. The duration of the glycosuria is unknown. The glycosuria has been continuous for the past fifteen months, the usual output varying from 30 to 50 gm., and the ordinary changes in the diet had very little effect

on the amount of sugar excreted. The sugar output was found to be independent of the urine volume. Synchronous studies of the blood and urine showed 2.7 per cent. sugar in the urine, with only 0.064 per cent. in the blood. The blood sugar curve following ingestion of 100 gm. glucose is somewhat atypical, but can be explained by the presence of arteriosclerosis and nephritis. There are no signs of diabetes mellitus.

Effect of Arsphenamin on Blood and Urine.—Five cases of tertiary syphilis with varying degrees of optic atrophy were studied by Weiss and Corson. The details of the chemical analyses of the blood and urine and the history of the cases are given in full.

Duration of Systole in Normal Persons.—Fenn asserts that it is possible to predict with a reasonable degree of accuracy the duration of systole in normal individuals. Clinical conditions accompanied by high blood pressure are often associated with prolongation of the Q-R-S-T interval. It is probable that this prolongation is of prognostic value, but from the data at hand at present a definite statement may not be made.

Postoperative Pulmonary Complications.—Among 1,604 cases submitted to some form of operative procedure under anesthesia, sixty-three patients developed a pulmonary complication that might be attributable to the operative intervention or to the anesthetic. There were five deaths among these sixty-three cases. Cutler and Hunt maintain that postoperative pulmonary complications in the majority of cases are due to embolism from the operative field. The result is pulmonary infarction or fatal pulmonary embolism. Anesthetists and anesthesia should not bear the blame for these complications. There is as yet no proof or evidence that chilling or acidosis plays any appreciable rôle in this field. A reduction in the number of cases that result in these complications can be had by (1) a reduction in trauma at operation; (2) accurate hemostasis; (3) the careful control of sepsis, and (4) the use of great caution in operating on patients who have demonstrable pulmonary disease. A high fluid intake and all general precautions giving assistance to the circulatory apparatus will be of definite value once such complications are established.

Antidiuretic Effect of Pituitary Extract.—Extract of the posterior lobe of the pituitary sprayed intranasally checked both the polyuria and polydipsia in Blumgart's case as effectively as hypodermic injections. All administrations of dried or aqueous extracts by mouth or rectum proved ineffectual. Histamin, whether sprayed, swallowed or injected subcutaneously, failed to modify the thirst of polyuria. Lumbar puncture, performed on two different occasions, did not lower the water or urinary output. The evidence indicates that the nasopharynx constitutes an important factor in certain diseased states, but whether absorption is accomplished by the blood stream, by the lymphatics, or by both channels, it is impossible to state.

Length of Life of Transfused Erythrocytes.—Red blood corpuscles from donors in Group IV transfused into patients in Group II with pernicious anemia and anemia secondary to nephritis, Wearn et al. found remained in the circulation longer than has been generally believed to be the case. The last of the transfused red blood cells disappeared from the circulation in from fifty-nine to 113 days, with an average of eighty-three days. No difference was noted in a series of observations in the duration of the stay of the transfused red blood corpuscles in the circulation between patients with primary anemia and secondary anemia (due to nephritis). In a single observation red blood corpuscles from a patient with pernicious anemia transfused into another patient with pernicious anemia, behaved as did the corpuscles from normal donors.

Boston Medical and Surgical Journal

April 13, 1922, **186**, No. 15

Modifications of Apparatus and Improved Technic Adaptable to Benedict Type of Respiration Apparatus. P. Roth, Battle Creek, Mich.—p. 491.
Vaginal Cesarean Section; Twelve Cases. L. E. Phaneuf, Boston.—p. 501.
Progress in Pediatrics. J. L. Morse, Boston.—p. 507.

Johns Hopkins Hospital Bulletin, Baltimore

March, 1922, **33**, No. 373

*Relation of Suprarenal Gland to Experimentally Produced Hypotension (Shock); Protective Effect of Preliminary Anesthesia. A. R. Rich, Baltimore.—p. 79.
*Clinical and Anatomic Study of Fifty-One Cases of Repeated Cesarean Section; Healing of Cicatrix: Occurrence of Rupture Through It. T. O. Gamble, Baltimore.—p. 93.
*Acute Lobar Pneumonia and Hematogenous Puerperal Infection. R. A. Johnston and H. J. Morgan, Baltimore.—p. 106.
*Diphtheria Bacillus Carriers: Results of Reexamination of Apparently Negative Cultures. B. C. Marshall and C. G. Guthrie, Baltimore.—p. 110.
Hydrogen-Ion Concentration of Tissue Growth in Vitro. M. R. Lewis and L. D. Felton, Baltimore.—p. 112.
Relation of H-Ion Concentration to Specific Precipitation. V. R. Mason, Baltimore.—p. 116.

Relation of Suprarenal to Experimental Shock.—The experimental work reported on by Rich shows that suprarenalectomized animals, subjected to uniform intestinal manipulation before the blood pressure has begun to decline as a result of suprarenalectomy, fall into shock exactly as do normal controls—the time required for the production of shock and the character of the blood pressure curves being the same in both series. It is, therefore, concluded that disordered suprarenal function is not a factor in the production of shock. The blood pressure begins to fall several hours after suprarenalectomy and becomes progressively lower until death. The fall in blood pressure is shown to be independent of the operative trauma and begins before asthenia has appeared. This is offered in support of the idea that the suprarenals are concerned in the maintenance of the blood pressure at the normal level, and certain objections to this belief are discussed. Animals that are kept lightly anesthetized with ether, for an hour immediately before the abdomen is opened, become very resistant to the shock producing effect of intestinal manipulation. Even when subjected to severe peritoneal trauma for a period of three hours, the blood pressure shows practically no tendency to fall and sensibility is retained. In contrast, if identical intestinal manipulation is begun more promptly after anesthetization, the blood pressure invariably begins to decline progressively within an hour, and the animal soon is in complete shock. An hour's ether anesthesia preliminary to opening the abdomen has proved to be a striking protective against shock under the conditions of these experiments. Ether has a distinct tendency to hasten the onset of shock once the blood pressure has begun to decline after the abdomen is opened. Cardiac failure is not a factor in the production of shock. Failure of the vasomotor center is not a primary factor in shock. The cardio-inhibitory center is shown not only to respond to stimuli, but also to function independently during deep shock. Its failure cannot be regarded as a cause of the condition.

Repeated Cesarean Section.—The study is too detailed to be reviewed in an abstract, but some of the points on which Gamble lays emphasis are: The weak cesarean scar may be due to a single factor or to a combination of factors, the most important of which is infection. The perfection of technic in suturing the uterine incision will undoubtedly lessen the incidence of weak scars. The uterine wound should not be closed, if possible, until firm contraction of the musculature has occurred. The dictum, "once a cesarean, always a cesarean," cannot be accepted without considerable reservation. A patient who has once been subjected to a cesarean section should enter the hospital several weeks prior to the expected date of confinement, so that she may have the benefit of immediate operation should rupture occur.

Pneumococcus Causes Puerperal Infection.—The demonstration of a fixed type pneumococcus as the causative agent of a puerperal infection developing during the course of acute lobar pneumonia is unusual, and makes the case reported by Johnston and Morgan one of considerable interest to the obstetrician as well as to the internist. A primipara, aged 35, gave a history of numerous infections, and, on the whole, of rather poor health. At the onset of labor she was exposed for a short time to inclement weather. Labor was completed by forceps delivery under chloroform anesthesia. Immediately following the birth of the child an acute lobar pneumonia developed. Evidence of the lowered resistance of the

patient to infection at this time was the absence of chill and leukocytosis at its onset, and particularly the existence of the septicemia with large numbers of bacteria in the blood stream (173 colonies per c.c.). Intra-uterine culture demonstrated the presence of the same organisms in the postpartum uterus. That this finding was not accidental, or due entirely to the normal oozing of blood infected with pneumococci, is clear, for a greenish mucopurulent uterine discharge developed, which contained numerous white blood cells and organisms. Furthermore, this condition persisted for several days after the disappearance of the bacteremia, and was accompanied by clinical evidence of uterine infection. Accordingly, it seems clear that this was a case of metastatic pneumococcus (Type 1) puerperal endometritis, which developed in a woman suffering from acute lobar pneumonia.

Diphtheria Bacillus Carriers.—From the results obtained by Marshall and Guthrie, it seems evident that when dealing with throat cultures from diphtheria carriers the customary laboratory practice of making single or repeated examinations within the first twenty-four hours may not yield all of the information available and may lead to erroneous conclusions. The error from this source alone, as judged from the results in 1,125 cases in which a second examination was made after forty-eight hours is about 9.5 per cent. It is recommended, therefore, that in the study of diphtheria bacillus carriers, either healthy or convalescent, all cultures which are negative up to twenty-four hours be reexamined after another day in the incubator.

Nebraska State Medical Journal, Norfolk

April, 1922, **7**, No. 4

Modern Medical Treatment of Gastric Ulcer. F. Conlin, Omaha.—p. 113.
Conservation of Hearing. C. G. Baird, Beatrice.—p. 117.
Principles of Dream Analysis. M. J. Breuer, Lincoln.—p. 121.
Urology in Relation to Surgical Diagnosis. J. S. Welch, Lincoln.—p. 126.
Anal Fissure and Its Treatment. L. E. Moon, Omaha.—p. 131.
Conservative Ovarian Surgery. C. H. Breuer, Lincoln.—p. 133.
Is Country Doctor Passing? G. O. Remy, Ainsworth.—p. 137.
Angina Abdominalis: Case Report. J. E. Meyer, Columbus.—p. 140.

Porto Rico Medical Association Bulletin, San Juan

Feb. 28, 1922, **16**, No. 135

*Renal Tuberculosis: Value of Nephrectomy. P. Perea Fajardo.—p. 1.
Case of Epidemic Cerebral Meningitis. R. C. R. Nazario.—p. 11.
*Antimony Treatment of Schistosomiasis. H. F. Carasquillo.—p. 15.
*Differential Diagnosis of Pyrexias Common in Porto Rico. A. Torregrosa.—p. 17. Conc'n.

Renal Tuberculosis.—Perea Fajardo reports recovery in five of six cases after removal of the tuberculous kidney. In one patient the cystitis still persists a year later, but much attenuated. In the six cases cited, slight occasional hematuria was the first symptom in one case. In other cases, pain in the left costal arch region for six months or pain in the right iliolumbar region for nearly two years, or pain in the left lumbar region for four years were initial symptoms. One patient had colic pains in the left side for a few months, with occasional anuria, terminating with expulsion of large quantities of purulent urine. All the patients had frequent and irresistible desire to urinate.

Schistosomiasis.—Carrasquillo has had twelve cases of Manson schistosomiasis in Porto Rico. Six patients were given systematic treatment with antimony and potassium tartrate with complete success in five. No traces of the parasite could be found in the stools up to eighteen months after the treatment, even though one woman had been infested for several years. He regards this drug as a specific for this schistosoma.

Tropical Pyrexias Common in Porto Rico.—Torregrosa brings to a conclusion his study of this subject. The various instalments have been summarized in these columns as they appeared. He has classified the cyclic intermittent, the continuous remittent and the irregular fevers, describing the modification of the clinical picture when any one of these tropical fevers is associated with syphilis, typhoid, leukemia, helminthiasis, etc. He reiterates, "No branch of tropical medicine is so important as pyretology, and nothing is so confusing as the differential diagnosis. The entire array of regional and cosmopolitan diseases liable to induce fever have to be kept in mind, and even the laboratory may explain only part of the clinical picture. . . . The physician in the tropics has to proceed by systematic exclusion and by intuition and tentative treatment."

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

April 1, 1922, **1**, No. 3196

*Nature and Significance of Heart Symptoms. J. Mackenzie.—p. 505.
*Value of Complement Fixation Test in Exclusion of Active Pulmonary Tuberculosis. A. L. Punch and A. H. Gosse.—p. 509.
Evidence of Pancreatic Disorder in Rickets. E. C. Dodds.—p. 511.
Postanesthetic Complications. G. F. R. Smith.—p. 513.
Diagnostic Value of Plantar Extensor Response. E. L. Fox.—p. 513.
Lethargic Encephalitis Affecting Nuclei of Midbrain in an Unusual Manner. W. Calwell.—p. 514.
Antiseptic Properties of Cyanine Dyes. C. H. Browning, J. B. Cohen and R. Gulbransen.—p. 514.
Interpretation of Symptoms in Disease of Central Nervous System. A. Feiling.—p. 515.
Slipping Rib. C. J. Marshall —p. 516.
Slipping Rib. H. K. V. Soltau.—p. 516.
Primary Colectomy for Acute Intestinal Obstruction in Patient Aged 70.—p. 516.

Nature of Heart Symptoms.—A summary of the difference in the heart's contraction arising in the conducting and contracting systems is given by Mackenzie. (1) The stimulus for the normal rhythm of the heart arises in tissues specially evolved for the purpose. The stimulus in auricular fibrillation arises in tissue specially evolved for contraction, the stimulus production being merely an incident in the contraction. (2) There is remarkable difference between the rhythms which arise in the conducting and contracting systems of the heart, due to the difference in the stimuli. These differences are shown especially in the response of the ventricle. The ventricular systole in the normal rhythm, as well as in those rhythms arising in any part of the conducting system, is complete and effective. The ventricular systole, when the stimulus arises in the muscle cells of the auricle, is often partial and ineffective, and when it arises in the muscle cells of the ventricle it is always ineffective. When the contraction starts in the muscle cells of the auricle, as in auricular fibrillation, the stimulus which arises is much more sensitive to agents which favor or retard its passage to the ventricle. The effect of digitalis is strikingly different, it having a far greater effect of digitalis is strikingly different, it having a far greater effect on auricular fibrillation and flutter and on the idio-ventricular rhythm than on any rhythm arising in the conducting system.

Value of Complement Fixation in Tuberculosis.—In approximately 1,100 pulmonary cases or controls Punch and Gosse have tried out their complement fixation test for pulmonary tuberculosis. Of these about 260 were definite cases of pulmonary tuberculosis, the criterion of a definite case being the undoubted presence of tubercle bacilli in the sputum. All save five of these gave a positive result. Of the five three subsequently gave a positive result. The authors believe that a negative result may occasionally be obtained in very acute cases of pulmonary tuberculosis due to the shortness of the interval between the invasion of the body by the tubercle bacillus and the onset of symptoms. Except in these rare cases the results of the test would suggest that a positive reaction is obtained by the time the infection gives rise to symptoms. One hundred and forty presumably healthy people or persons suffering from nontuberculous diseases were taken as negative controls. Three gave a positive result. In one case definite evidence of enlarged, presumably tuberculous, glands in the neck was subsequently discovered; in another, on more careful examination, it was impossible definitely to exclude a tuberculous lesion in the lungs; while in the third no evidence of tuberculosis could be discovered. Of the remaining 700 cases about 220 gave a positive result. These were doubtful cases clinically, so that no definite conclusion could be drawn from them. All that could be said at the time without later investigation was that there seemed to be a reasonable correspondence between the clinical condition on the one hand and the negative or positive result on the

other. In many of the cases which gave a positive result the accuracy of the test has been proved by the finding at a later date of tubercle bacilli for the first time in the sputum.

Indian Journal of Medical Research, Calcutta

July, 1921, **9**, No. 1

Cercaria of Schistosomum Spindalis (Montgomery). M. B. Soparkar.—p. 1.
Some Furcocercous Cercariae from Bombay. M. B. Soparkar.—p. 23.
*Correlation Between Chemical Composition of Anthelmintics and Their Therapeutic Values in Connection with Hookworm Inquiry in Madras Presidency. X. Betanaphthol. J. F. Caius and K. S. Mhaskar.—p. 33.
Production of Bacillus Influenzae Vaccine on Large Scale. R. H. Malone.—p. 56.
Large Scale Production of Pneumococcus Vaccine. R. H. Malone.—p. 63.
Bacteriologic and Laboratory Technic, Section II. W. F. Harvey.—p. 66.
Some Cases of Myiasis in India and Persia, with Description of Larvae Causing Lesions. J. A. Sinton.—p. 132.
Some Bursate Nematodes from Indian and African Elephants. C. Lane.—p. 163.
*Physiologic Changes at High Altitudes and Their Relation to Mountain Sickness. R. W. G. Hingston.—p. 173.

Betanaphthol a Powerful Vermicide.—Caius and Mhaskar found betanaphthol to be a powerful vermicide acting both on ankylostomes and necators. Up to a dose of 40 grains, the advantage lies with a single portion treatment; beyond 40 grains the drug may indifferently be given in one, two or three portions. In sufficiently large doses betanaphthol is an effective ascaricide. Up to 60 grains dosage betanaphthol is a very safe drug. Betanaphthol has marked vermifugal properties and no after-purge is required in the treatment.

High Altitudes Cause Formation of More Erythrocytes.—A person who ascends from a low altitude to a high altitude is able gradually to acclimatize himself to the requirements of the greater height. His method of acclimatization is by the development of an increased number of red blood corpuscles in order to provide the body with additional oxygen carriers to deal with the rarefied air. The number of corpuscles increases in proportion to the altitude, and when a sufficient number has been developed in accordance with the altitude then acclimatization is complete. If the ascent is gradual the manufacture of corpuscles keeps pace with the requirements of the altitude and no inconvenience is felt. If, on the other hand, the ascent is rapid, then a sufficient number of corpuscles has not time to develop; the blood is relatively deficient and the person suffers from mountain sickness. If he remains for an adequate time at the altitude he has reached, he will gradually become acclimatized and his distress will disappear. In certain persons the development of corpuscles is delayed and their sufferings as a consequence are acute and prolonged. People who live permanently at a high altitude have a richer blood supply than those who inhabit low altitudes but differ in no other respect. The number of corpuscles in the blood of a dweller at low altitudes can increase until it reaches ultimately the number normal to the dwellers at high altitudes. Returning to sea level, the number of corpuscles will diminish until the normal for the altitude is restored.

Medical Journal of South Africa, Johannesburg

February, 1922, **17**, No. 7

Trophic Changes in Syringomyelia. F. H. Kooy.—p. 133.
*Respiratory Acceleration Phenomenon. T. Wassenaar.—p. 138.
Estimation of Sugar in Blood. A. D. Stammers.—p. 139.
Case of Acromegaly with Ocular Symptoms and Roentgen-Ray Findings.—p. 141.
Origin and Development of Johannesburg Hospital and Its Branches. R. Daly.—p. 142.

Respiratory Acceleration Phenomenon.—During the course of some experiments, in which use was being made of decerebrate preparations Wassenaar noticed that compression of the thorax more or less in the heart region caused an acceleration of the respiration. The compression was performed either by gripping the thorax from the ventral side between the thumb and the other fingers and then squeezing softly, or by pressing with the flat hand on the upper side of the chest. The reflex nature of the acceleration phenomenon was proved in various ways.

Archives Franco-Belges de Chirurgie, Brussels

January, 1922, **25**, No. 4

*Cancer of the Rectum. Desmarest.—p. 293.
*Lymph Currents in the Abdomen. P. Descomps and Turnesco.—p. 298.
Occlusion of Intestine by Meckel's Diverticulum. E. Delannoy.—p. 320.
*Gastrostomy in Otorhinolaryngology. Berard and Sargnon.—p. 329.
*Cysts in the Bones. A. Mouchet and P. Le Gac.—p. 337.
Operative Indications in Acute Appendicitis. G. Leclerc.—p. 344.
*Opening of Parotid Abscess into Ear. M. Ferron.—p. 352.
*Metal Bands for Fractured Bone. A. Lambotte.—p. 363.
*Reconstruction of the Astragalus. A. Lambotte.—p. 369.
Technic After Astragalectomy. J. Moreau.—p. 371.
Fractures of the Astragalus. Van der Elst.—p. 383.

Cancer of Rectum.—Desmarest reports 43.4 per cent. of satisfactory results in 23 cases of cancer of the rectum removed after amputation of the coccyx. The interval since has been from five to six and a half years in 4 cases, and over four in 3 others, and from three to four years in 3 others, without signs of recurrence. If the cancer is adherent, it is already too late to ward off recurrence unless the adhesions are merely of inflammatory origin. In such cases his experience has demonstrated the advantages of first making an iliac anus and disinfecting the rectum; then, from ten to fifteen days later, applying radium, and, three weeks later, removing the site of the cancer by a combined abdominal-perineal technic. If the cancer is still movable, he makes first a temporary fistula into the upper portion of the iliopelvic colon; then applies radium as above, and three weeks later amputates by the coccyx-perineum route, saving the sphincter and drawing the colon down to it, concluding, later, by closing the temporary artificial anus. In men, the abdominal-perineal operation is the only feasible one, and no attempt should be made to save the sphincter. In any event, unless the raw surface of the colon bleeds when it is cut, it is doomed to speedy gangrene when drawn down.

The Abdominal Lymph Currents.—Eight illustrations accompany this study of the main lymphatic currents, their convergence and their satellite ganglia.

Gastrostomy in Otorhinolaryngology.—Berard and Sargnon refer to emergency cases of stenosis of the esophagus or lower pharynx in which a fistula into the stomach may be necessary to feed the patient, either to ward off starvation or to ward off danger of aspiration of food into the air passages. It may be indispensable as a preliminary to operations on the esophagus, throat or mouth. Their experience includes fifty cases, published in 1914. There has only been one death in their series since. With the Fontan technic and local anesthesia, the prognosis of the gastrostomy is benign and the results satisfactory.

Cysts in Bones.—Mouchet and Le Gac protest against the traumatic origin which nearly all the patients claim. In their cases, radiography, even two days after the trauma, showed the fully developed cyst; the trauma merely called attention to it. Under roentgenoscopy it may be seen that the trauma has a direct curative action: The cracking of the wall of the cyst allows the fluid to escape, and the periosteum starts the repair of the bone. Hence immobilization is all that is necessary when the cyst has been cracked. On the other hand, if the cyst wall is intact, and the bone is one of minor importance, such as the fibula, then immobilization alone may be all that is needed. But with the femur or the tibia, the cyst should be trephined and scraped out, but without attempting to fill up the cavity or drain it. Resection should never be done without histologic examination; the cyst once recognized, conservative treatment must be the rule for these benign cysts which are probably merely of dystrophic origin. They are usually near the knee or remote from the elbow, and the humerus is the favorite site.

Abscess in Parotid Region Opening Into the Ear.—Ferron reports four cases, all encountered within a few months. Cope has commented on the fatal termination of three in seven cases of acute parotitis with necrosis, saying that the inadequacy of the incision was evidently a factor in the fatal outcome. Ferron operated through an incision parallel to the anterior margin of the sternocleidomastoid, from the ear or retro-auricular groove to below the angle of the jaw. The vast wound thus opened up healed smoothly after curetting, with a comparatively small scar.

Metal Bands for Fractured Bones.—Lambotte comments that the Parham metal bands are not solid enough to stand much strain, while the instruments used are heavy and awkward. He thinks he has overcome these drawbacks by the use of a little U buckle with two slits through which the end of the metal band is slipped. The ends of the U are then folded down over the end of the band as it is turned back when the *cerclage* is complete. The end of the band is thus held firm with this supplementary buckle, and it can stand a much heavier strain. He prefers screws for fastening a metal plate to the bone unless the bone is abnormally porous. In this latter case, the metal bands are indispensable. In the discussion that followed, several surgeons reported the loosening of the Parham bands, or rupture of a band at the point where it was bent. They said that this probably could not have occurred with Lambotte's supplementary sliding buckle. Fourteen illustrations accompanying the article.

The Ankle After Astragalectomy.—Moreau gives minute directions for reconstructing the ankle after astragalectomy, warning of several points to be avoided.

Archives des Maladies du Cœur, etc., Paris

February, 1922, **15**, No. 2

Palography: Photographic Record of the Pulse. Gil-Casares (Santiago). —p. 49.
Physostigmin in Cardiac Therapy. J. Minet, R. Legrand and Prelot. —p. 60.

Bulletin de l'Académie de Médecine, Paris

March 14, 1922, **87**, No. 11

Senescence and Endocrinology. E. Gley.—p. 285.
Home for Nursing Mothers. Committee Report.—p. 303.
*Meningitis from Helminthiasis. G. Guillain and C. Gardin.—p. 308.
Blood Pressure and Tension of the Arteries. E. Doumer.—p. 316.
*Milk of Tuberculous Women. J. Chambrelent and H. Vallée.—p. 319.
*Acetonemia, Pancreatitis and Syphilis. A. Remond.—p. 321.

Helminth Meningitis.—Guillain and Gardin report the case of a young woman with headache and vomiting for five days. She ascribed these symptoms to a tapeworm discovered six months before. As she was pregnant at the time, its expulsion had been postponed and she had been delivered of a viable child at term. The symptoms continued to progress until the clinical picture of tuberculous meningitis was complete by the sixteenth day. Then under male fern, plus calomel, the tenia solium was expelled, and recovery was rapid and complete. The reactions in the spinal fluid were all of the type characteristic of tuberculous meningitis except for the absence of tubercle bacilli. They compare with this case a number of other cases of irritation of the meninges from helminth toxins, and suggest that this may be the explanation of certain meningeal conditions of hitherto obscure origin.

Milk of Tuberculous Women.—Tubercle bacilli were found in the milk of 13 per cent. of fifteen lactating tuberculous women. In four others, with sputum swarming with tubercle bacilli, none could be found in the milk, even on inoculation of guinea-pigs. None of the women had any lesions in the breasts.

Acetonemia in Children.—Remond reports a further series of 5 cases of acetonemia in children, with headache, intolerance of the stomach, chilliness and syncopal condition, and pure mucus passed by the anus. The head of the pancreas was tender in all, and the acetone surpassed 1.5 gm. per liter of urine. The latter contained notable proportions of diacetic acid. In a sixth case the child died in one of the attacks. He gave alkaline treatment to all, but in 2 cases the phenomena promptly subsided under injection of pancreas extract. These 2 children (7 and 9) complained that the injection hurt; but that this was far preferable to the severe headache they had been having. The pain subsided in half an hour after the injection. These experiences have convinced him that acetonemia is the result of acute insufficiency of the pancreas. He calls attention in conclusion to the significant fact that inherited syphilis was present in every case, direct in 3 cases, and from a preceding generation in the others. There were no manifestations of the syphilis apparent, but the history was beyond question. There is thus reason to assume, he says, that acetonemia and acidosis in children are the result of insufficiency of the pancreas, and that this is a manifestation of inherited syphilis.

Bulletin Médical, Paris

March 18, 1922, **36**, No. 12

*Lead Poisoning. F. Heim, E. Agasse-Lafont and A. Feil.—p. 223.
*Diagnostic Intratracheal Injections. Ichok.—p. 226.

Lead Poisoning.—Heim and his co-workers describe the two findings which warn of injury from lead even before the plumbism is well established. The number of leukocytes is usually normal, but about 40 per cent. may be mononuclears. The erythrocyte figure is also normal in the presaturnism phase. When the workmen are once saturated with lead, there is pronounced anemia, which is very slow in receding, even when there is no further contact with lead. The erythrocytes may show a basophil plasma or basophilic granules, and the latter is the earliest and most constant sign of injury from lead. They have found it in 50 per cent. of all persons exposed to lead poisoning, regardless of whether they showed any signs of plumbism or not. This basophilic granulation is not found outside of lead poisoning except, inconstantly, in very severe anemia or certain grave intoxications. The granules show as fine black spots, some as fine as dust, others a little larger, scattered irregularly through the protoplasm. The other pathognomonic finding is the presence of lead in the urine, but the technic required to detect it is tedious, even with electrolysis and the colorimeter. They never found any lead in 100 normal urines tested, while it is constantly present in lead poisoning, as a large proportion of the lead is eliminated through the kidneys. The spinal puncture fluid may also show the presence of lead; in one of their cases this first explained a puzzling brain affection.

Diagnostic Intratracheal Injections.—Ichok injected 5 c.c. of a 1 per thousand solution of methylene blue into the trachea of rabbits, through the skin. Then the urine dripping from a retention catheter in the bladder showed the stain in from fifteen to twenty-five minutes in normal animals, but the interval was much longer when the lungs or pleura were diseased. He thinks this method might have diagnostic value in man to trace the course upward or downward of disease of the respiratory apparatus. Recent literature on intratracheal medication and vaccination is compared with this research. It was done in Besredka's laboratory.

Bulletins de la Société Médicale des Hôpitaux, Paris

March 3, 1922, **46**, No. 8

*Transmission of Sounds in Lung. J. Génévrier and A. Robin.—p. 383.
*Radiotherapy in Syringomyelia. A. Coyon, J. Lhermitte and J. Beaujard.—p. 387.
Diabetes with Abolished Reflexes. Pinard and Mendelsohn.—p. 397.
*Treatment of Vascular Spasm. R. Morichau-Beauchant.—p. 404.
Parkinsonian Symptoms in Retrospective Diagnosis. Roger.—p. 409.
*Massive Coagulation of Spinal Fluid. E. de Massary and J. Girard.—p. 413. Idem. L. Boidin and J. de Massary.—p. 418.

Transmission of Sounds in Lung.—Génévrier analyzes the mechanism of the vertical and horizontal transmission of sound in pathologic lungs, and interpretation of the findings.

Radiotherapy of Syringomyelia.—The case described here brings the histologic confirmation of the retrogression of the gliomatous form of syringomyelia under systematic roentgen exposures of the upper spine, a series of twenty-six exposures and a second series of four, the dose about 3 H units; distance 15 cm. The young man's earning capacity was restored when he was on the point of becoming helpless. Thirteen years later he developed pulmonary tuberculosis, and necropsy revealed the retrogression of the gliomas, and obliteration of the cavities in the exposed portion of the spinal cord, while the gliomatous tendency in the nonexposed portions had continued a slowly progressive course. Nothing could be discovered to indicate injury of meninges or nervous elements from the roentgen rays. Guinea-pig spinal cords can bear up to 10 or 12 H without harm, and the therapeutic doses never surpassed 4 H. In conclusion a second case of syringomyelia is described in which the disease has been completely arrested in the fifteen months since treatment was begun. Once every eight days the cervicodorsal region is given two

cross-fire exposures of 2.5 H units each. The patient is now at the twelfth sitting of a second series of eighteen.

Sodium Citrate Treatment of Arteritis and Vascular Spasm.—Three cases are described in which the ischemia from obliterating arteritis or vascular spasm, or both, was relieved and a dangerous condition remedied by 3 or 4 gm. of sodium citrate taken by the mouth over long periods, and resumed from time to time. Beauchant theorizes to explain the mechanism of the prompt and durable benefit, and suggests that by thus relieving the vascular spasm, improvement might be realized in many conditions in which this is more or less of a factor, such as angina pectoris, Raynaud's disease, and permanent high blood pressure and the brain disturbances resulting therefrom.

Meningitis with Coagulation of Spinal Fluid.—The spinal meningitis in the two cases described was accompanied by spontaneous and massive coagulation of the spinal fluid. The receptacle could be turned upside down for ten minutes without a drop escaping. The communication between the spinal and the cerebral fluid was unhampered in one of the cases, and obstructed in the other.

Coagulation of Spinal Fluid.—In Boidin's case the acute meningomyelitis had developed consecutive to erysipelas, and the spinal fluid coagulated solid when drawn. Streptococci, staphylococci and the pyocyaneus were cultivated from the pus and spinal fluid.

Encéphale, Paris

February, 1922, **17**, No. 2

*Anatomic Conditions for Binocular Vision. M. Minkowski.—p. 65.
Mental Prophylaxis in the Army. Chavigny.—p. 97.
*Pathogenesis of Epileptic Seizure. A. Antheaume and L. Trepsat.—p. 103.
Mental Confusion of Malarial Origin. C. Papastratigakis.—p. 105.
*Pathogenesis of Certain Psychoses. E. Dupré and C. L. Trepsat.—p. 109. Conc'n.

Anatomic Conditions for Binocular Vision.—Minkowski gives nine plates of photomicrograms of the central optic tract in man and animals, and seeks to interpret the findings.

Pathogenesis of Epileptic Seizures.—Antheaume and Trepsat injected rabbits with urine and spinal fluid from an epileptic but no effect was apparent. Injection of blood serum, however, induced violent convulsions, soon followed by death, in five or six rabbits. The amount of the epileptic's serum injected was 0.5 c.c. This amount of normal serum induced only a mild reaction for a few seconds.

Psychanalysis of Certain Psychoses.—This long article presents arguments to confirm that suppressed ideas and emotions play a large part in the development of certain grave psychoses. The sequence of events is shown clearly in some typical cases reported.

Paris Médical

March 18, 1922, **12**, No. 11

Dermatology in 1922. Milian and Brodier.—p. 221.
Superficial Cerebriform Hyperplasia of Tongue. L. Brocq.—p. 224.
Transmission to Man of Cat Sarcoptes Scabies. G. Thibierge.—p. 229.
*Precancer Skin Affections. Gougerot and Rupp.—p. 234.
Carbon Dioxid Snow in Dermatology. L. Lortat-Jacob.—p. 237.

Precursor of Cancer.—Gougerot describes a case of an erythematosquamous dermatosis with hyperkeratosis of the palms and soles and latent cancer of the tongue.

Presse Médicale, Paris

March 15, 1922, **30**, No. 21

*Calcium Chlorid in Treatment of Serositis. L. Blum.—p. 221.
Azotemia and Acidosis in Mental Confusion. R. Targowla.—p. 225.

Calcium Chlorid in Treatment of Serositis.—Blum has found restriction of salt plus administration of calcium chlorid an effectual means of influencing inflammatory affections of serous membranes. He describes several cases of pleurisy with effusion, and peritonitis, the charts showing how dropping salt from the diet reduced the fever and sometimes the effusion, while this effect was magnified by the calcium chlorid. The sodium is the noxious element. The calcium crowds out the sodium, and the latter is eliminated, and with it the fluid pathologically collected, wherever it may be. The sodium maintains the inflammatory lesion, he explains, and the calcium crowds it out here, and the inflammation is checked. This occurred so regularly in his tuberculous cases that, when benefit was not soon apparent, he sought for impeding complications or other reason. There do not seem to be any untoward effects from this treatment; the longest interval since has been four months. The rapid absorption of the effusion warded off adhesions. "By thus utilizing the action of ions on biologic phenomena we can modify the soil at will, and obtain salutary reactions." He gives large doses of the calcium chlorid in acute cases, up to 15 gm. of the powder in twenty-four hours, repeating the next day, or only half this dose if the fever drops, and then suspending entirely. If the fever keeps up, he increases to 22 gm. for two or three days. In subacute and chronic cases he begins with two days of abstention from salt. It was never necessary to restrict intake of fluid. As the powder is so hygroscopic, he prefers to give the calcium chlorid in fluid form: 30 gm. each of dry calcium chlorid and soluble starch; 20 gm. of water, and lemon syrup Q. S. to 100 gm. Ten teaspoonfuls of this are equivalent to 15 gm. of the dry calcium chlorid.

March 22, 1922, **30**, No. 23

*First Clinical Signs of Syphilitic Chancre. J. Lacassagne.—p. 245.
*Treatment of Paraplegia from Pott's Disease. J. Calvé.—p. 246.

First Signs of Syphilitic Chancre.—In six cases in which the first appearance of a chancre on the genital mucosa was detected, there was no papule, no vesicle nor hard nodule. All that was evident was a round or oval erosion, without definite edges, not sensitive even to the touch of an instrument, but oozing a serous dew in which spirochetes were found. The erosion in the five men was in the retroglandular sulcus. Three were medical men, and contagion dated from twenty-three, twenty-five and thirty days.

Treatment of Paraplegia from Pott's Disease.—Calvé works a curved trocar sound through the conjugate foramen into the abscess in front of the spinal cord, and then aspirates. He has applied this method ten times on 6 patients, and the results have been very encouraging, as he describes in detail, with illustrations of the technic. Catheterization through the conjugate foramen in this way gave 2 cures and 1 considerable improvement in 3 progressive paraplegia cases. In the 3 others the paraplegia was of such long standing that there was no hope of improvement.

March 25, 1922, **30**, No. 24

*Anaphylactic Phenomena in Gout. A. Chauffard.—p. 253.
Variety of Imponderables in Infant Feeding. H. Godlewski.—p. 256.
Present Status of Sodium Citrate in Treatment of Vascular Disease. L. Cheinisse.—p. 258.

Gout as a Local Anaphylactic Process.—Chauffard says that Grigaut's modification of the Folin-Denis method has shown that in normal conditions the blood never contains over 4 or 5 cg. of uric acid per liter. In his 27 cases of acute or chronic gout the average was 9.4 cg. of uric acid and 2.25 cg. of cholesterin in the blood serum, while the Ambard ureosecretory index was always high. In 8 of 9 dogs tested on various diets, the uric acid content of the blood in the hepatic vein was less than in blood from the portal vein. The difference ranged from 20 to 53 per cent., with an average of 33. The highest figures were obtained in the dogs fed on liver and spleen, both rich in uric acid. In a group of 3 dogs, given no food, or only milk, the uric acid content was the same in both veins. When the liver becomes unable to sort out and retain the uric acid in this way, the exogenous uric acid, accumulating in the blood, explains the hereditary tendency and the early development of gout when nothing in the individual's mode of life seems to invite it. The uric acid thus accumulating in the system impregnates the tissues besides being cast off in the urine and, as by a vicarious mode of elimination, settling in the joints. A course of thermal mineral waters mobilizes the uric acid impregnating the tissues. It passes into the blood and is then cast off in the urine. A month or two after the course, the hyperuricacidemia was always found much reduced. The erythrocytes in 5 gouty subjects tested contained nearly twice as much uric acid as in the normal—a manifestation of the general impreg-

nation of the tissues with uric acid. The uric acid content of ascitic and pleural effusions parallels that of the blood, but the cerebrospinal fluid contains only minute quantities. Uric acid thus behaves differently from urea; it is less diffusible than the latter.

The liver seems to be responsible likewise for the high cholesterin content of the blood serum in gout. The local deposits of cholesterin, when it is in excess in the blood, are responsible not only for xanthelasma and white patches on the retina but are also a factor in production of gallstones. He has found cholesterin in tophi; in one case it formed 8.3 per thousand and uric acid 2.9 per thousand of the tophi in the fingers. No cholesterin was found in the joint urate deposits in this case. In another case the tophus in the heel yielded 21.3 per thousand cholesterin and 85.8 per thousand uric acid. The gouty incrustation in a joint is pure white, while the yellowish tint of the tophus is sometimes perceptible through the skin.

The excessive uric acid content renders precarious the colloidal balance of the blood serum. Any slight cause then is liable to upset this unstable balance, chilling from dampness, errors in diet, trauma of a joint, especially of the big toe from fatigue or a tight shoe. Any of these causes is liable to sensitize the gouty subject so that a glass of heavy wine or other disturbing cause will upset the colloidal balance, and then the acute attack follows. The latent sensitization, the provocative cause and the sudden shock at the point where the uric acid has crystallized—these are the three phases of gout.

Schweizerische medizinische Wochenschrift, Basel

March 9, 1922, **52**, No. 10

*Nervous Disturbances with Heart Disease. A. Jaquet.—p. 245.
Hemorrhagic Purpura in Chicken-Pox. W. Hoffmann.—p. 250.
Duplication of Common Iliac Artery. H. Kobelt.—p. 252.
Efficacy of Ammonium Carbonate in Erythema Nodosum. R. Ammann. —p. 254.

Nervous and Mental Disturbances in Heart Disease.—Jaquet mentions, among others, headache, inability to sleep; the patient cannot find any comfortable place in bed or his cold feet keep him awake even with a hot water bottle. A brief tendency to dizziness and syncope is common, even in the young. A sudden transient inability to move hands or feet has also been observed, but it lasts only a few minutes. Lack of attention, a change in character, and actual psychoses are not rare. He warns that the physician may be responsible for them, by his heedless use of the terms "heart failure" "calcification of the arteries," etc., thus frightening the patient. Pleuropericarditis in one woman had left cicatricial adhesions which were mistaken for grave organic disease, and the patient was warned to beware of all efforts or heart failure might result. She stayed in bed for nine months, not lifting a finger, before she could be convinced that she was not in grave danger. Then she got up and resumed an active life. Nervous dread and depression interfere with the action of heart tonics. Often, in heart disease, psychotherapy is the main thing. It frequently happens that a stay in a sanatorium is of great benefit. The patient loses his dread and restlessness when he knows that a physician is at hand day and night. This frequently tranquillizes permanently. In conclusion Jaquet warns against medicinal intoxication; he witnessed in two cases the development of a psychosis after the therapeutic administration of caffein.

Annali d'Igiene, Rome

January, 1922, **32**, No. 1

*Bacteriologic Research on Influenza. B. Gosio et al.—p. 1.
*Serotherapy for Influenza. B. Gosio.—p. 58. Idem. M. Ghiron.—p. 65.
*Bacterial Symbiosis in Influenza. P. Caldarola.—p. 74.
*Pathogenesis and Treatment of Influenza. B. Gosio.—p. 82.

Serotherapy of Influenza.—Gosio is chief of the bacteriologic laboratory of the public health service of Italy, and for three years he has been studying Pfeiffer's bacillus in relation to influenza, and has become convinced that other micro-organisms have been mistaken for it. This and its rapid disappearance from the invaded region explain the way in which it has been discredited in the etiology of influenza. He and his co-workers describe an improved culture medium for it, and emphasize the peculiar toxigenic power of the true Pfeiffer bacillus. It is extremely toxic in itself, and it has an intense affinity for the leukocytes. He has been successful with an antiserum made with it, and Caldarola has succeeded in reproducing in animals a typical pneumonia by the symbiosis of the Pfeiffer bacillus and the hemolytic streptococcus, when neither alone induces appreciable symptoms. The presence of the true Pfeiffer bacillus in symbiosis with other micro-organisms is liable to confer an unprecedented malignant character on them. The Pfeiffer bacillus, Gosio states, is never found in the blood stream, adding, "Its curious, aristocratic sensitivity in respect to certain kinds of blood and certain species of micro-organisms suggests the possibility of prophylaxis by utilizing antagonistic bacteria."

Pediatria, Naples

March 1, 1922, **30**, No. 5

*Tuberculous Antigens in Cerebrospinal Fluid. I. Nasso.—p. 193.
*Atypical Meningitis in Young Children. G. Squarti.—p. 198.
Present Status of Puncture of the Brain. R. Vaglio.—p. 217.

Tuberculous Antigens in Spinal Fluid.—Nasso relates that of the 26 publications on the own urine reaction, according to Wildbolz, 17 ascribe differential value to it, while in 9 the verdict is unfavorable. Nasso's own experience with it in 53 children confirmed its importance as a test for active tuberculosis in children. He has been applying a similar intradermal test with cerebrospinal fluid, condensed to one tenth, in tuberculous meningitis. There was an intense reaction in all of the 6 children with tuberculous meningitis, and in one with miliary tuberculosis. The own urine reaction was positive likewise, while the tuberculin skin test was positive in only 2 in the 5 in this group that were tested. The intradermal test with 1:1,000 tuberculin was positive in 5. The age ranged from 10 months to 14 years. The reaction to the cerebrospinal fluid injection thus seems to be pathognomonic for tuberculous meningitis or miliary tuberculosis. The response was negative in the one case of tuberculous glands tested.

Atypical Epidemic Meningitis.—In twelve cases reported by Squarti in children at the Rome clinic, the mortality was over 58 per cent., and in four cases the course of the disease was atypical. All of the children were under 3. The disease may occur in fulminating form, and the sudden death may have medicolegal importance. Or the onset may be hyperacute, with a prolonged milder course. There is also a pseudotyphoid form, a chronic form with cachexia, and a walled-off form, an intermittent, an abortive, and a purpuric-septicemic form, and a walking form which may disappear without leaving a trace, or it may prove fatal after a series of exacerbations. In infants the disease may be accompanied by tetany, by convulsions, or generalized hyperesthesia. Or there may be paresis instead of rigidity of the muscles of the neck. There is also an ephemeral, masked form, the symptoms variable and fleeting. In one of the four atypical cases described in detail, a child of 2½ was convalescing from typhoid when the meningitis developed, and both the typhoid bacillus and the meningococcus were found in the spinal fluid.

March 15, 1922, **30**, No. 6

*Neo-Arsphenamin in Ulcerative Stomatitis. R. Spanò.—p. 241.
*Thymic Deaths in Inherited Syphilis. G. Battino.—p. 248.
Tryptophan in Milk in Relation to Age of Milk. C. Boccadoro.—p. 257.

Arsphenamin Treatment of Vincent's Angina.—Spanò reports all cured of fourteen children given neo-arsphenamin in treatment of ulcerative stomatitis of the Vincent type. Three or four intravenous injections were made, at two or three day intervals, the doses ranging from 5 to 10 cg. according to the age of the child. The cure was complete in from six to ten days except in one girl of 7 who had been given four injections on alternate days, and the cure required twelve days.

Thymus Death.—Battino reports the death of two children in one family for which nothing but the extra large thymus could be incriminated. The parents were asthenic and closely related, and there had been several abortions. The boy of 4 died suddenly during the night. The girl of 6 had eaten heartily at noon and again an hour or two later. Walking

home, she fell suddenly lifeless, without laryngospasm or cyanosis of the face. Comparison with similar cases on record suggests that exaggerated gastro-intestinal pressure on the diaphragm may entail congestion in the thymus, and the nerves in the thymus may by reflex action arrest the heart. Mouriquand has reported a case in which treatment as for syphilis was followed by return of the thymus to normal size.

Policlinico, Rome

Feb. 27, 1922, **29**, No. 9

The Basal Metabolism. A. Filippini.—p. 281.
*Complications of Inguinal Herniotomy. F. Napoletano.—p. 289.
*Nervous Manifestations of Helminthiasis. V. Grifi.—p. 292.
Local Prophylaxis of Acute Rhinopharyngitis. Gioseffi.—p. 293.

Preoperative and Postoperative Complications of Inguinal Hernia.—In one of the three cases reported by Napoletano, the testicle had been drawn up out of its proper place by the cicatricial shriveling after herniotomy. In another case an abscess had developed in the hernial sac.

Nervous Manifestations of Helminthiasis.—Grifi reports a case in which a boy of 11 developed spastic phenomena and other symptoms suggesting an organic lesion of the pyramidal tracts, but the whole clinical picture melted away after treatment for ascaridiasis.

March 6, 1922, **29**, No. 10

Bismuth in Treatment of Syphilis. C. Ducrey.—p. 313.
Hernia as Cause of Varices. S. Bile.—p. 316.
Anatomic Basis for Anaphylaxis. T. Silvestri.—p. 319.
*Sterilization of Milk for Protein Therapy. A. Rivara.—p. 322.
*Surgery of the Bladder. G. B. Sigurtà.—p. 324.
Present Status of Glycorachia in Disease. Trenti.—p. 327.

Improved Technic for Protein Therapy.—Rivara's experiments on four dogs have apparently demonstrated the complete tolerance and harmlessness of milk sterilized with ether, even for intravenous injection. He adds 100 c.c. of ether to the whole milk in a vial holding 500 c.c. The vial is then sealed and agitated well. It is agitated anew several times a day, at a temperature of 37 C. for ten days. Then with a long pipet, reaching to the bottom of the vial, the milk is drawn and warmed slightly over a flame to evaporate the ether. Samples of milk thus treated never developed microorganisms, and the dogs bore intravenous injection up to 10 c.c. without harm. The usual amount was 3 c.c., and this was continued for thirty days without any local or general by-effects except occasional slight acceleration of pulse and respiration, especially when the ether had not been entirely evaporated.

Instruments for Surgery of the Bladder.—Sigurtà gives illustrations of instruments in current use and of some of his own devising, pointing out the advantages of the latter, especially his hypogastric cystotome, his catheter with spreading tip blades, and his two-way siphon tubes.

Riforma Medica, Naples

Jan. 30, 1922, **38**, No. 5

*Osteomalacia. G. Gentili.—p. 97.
Calcium Metabolism in Normal Man. G. E. Puxeddu.—p. 98.
Curvature of Spine Modifies Percussion. L. Siciliano.—p. 101.
Ascarids in Strangulated Femoral Hernia. F. de Gironcoli.—p. 102.
Heliotherapy in Seashore Sanatorium. M. Quattrini.—p. 112.

Osteomalacia.—Gentili remarks that although experimental production of insufficiency of any of the endocrine glands has never yet induced the production of osteomalacia, yet there is abundant testimony on hand as to the share of certain endocrine glands in the production of the clinical picture in man. In two cases he describes in detail, in women of 30 and 42, the first symptoms were noted at about the fourth month of a pregnancy. Delivery was normal, but the pains and other symptoms of the osteomalacia continued a progressive course during lactation. Treatment then with ovarian extract and calcium phosphate was soon followed by improvement, and complete cure in three months in one case. In the other case, the osteomalacia had crippled the woman for six years, but it then subsided under ovarian treatment, arsenic and calcium phosphate, and the health has been persistently good since. This patient repeats the course of ovarian treatment occasionally as a prophylactic measure.

Brazil-Medico, Rio de Janeiro

Feb. 25, 1922, **1**, No. 8

Ruptures of Gravid Uterus. F. Magalhães.—p. 93.
Tracheotomy for Foreign Body in Larynx. F. Castilho Marcondes.—p. 95.
The Bacteriophagum: Transmissible Microbian Lysis. Costa Cruz.—p. 96.

Revista Española de Medicina y Cirugía, Barcelona

November, 1921, **4**, No. 41

Tumors of the Pharynx. H. Coenen.—p. 627.
*Reconstruction of the Urethra. M. Serés.—p. 634.
Vitamins and Gastric Ulcer, etc. J. Luis-Yague Espinosa.—p. 639.
Diathermy in Gynecology. G. Ribas.—p. 642.
Anaphylaxis and Pregnancy. P. Gonzáles et al.—p. 644.

Reconstruction of the Urethra.—Serés has applied in a case of extensive laceration of the male urethra and a case of epispadias, a flap of mucous membrane taken from the vagina of an operative cystocele case. His illustrations show the technic. The prompt and perfect healing of the flap and the facility with which the lumen can be dilated to the proper size are the main advantages of the method. To be perfectly successful, it requires complete diversion of the urine until the flap has healed.

December, 1921, **4**, No. 42

*When Does Parenchymatous Syphilis Develop? J. Calicó.—p. 683.
Formaldehyd Test of Syphilitic Serum. M. Armangué and P. González.—p. 685.
Rejuvenation. Serrallach.—p. 686.
Calculus in Tonsil. L. Suñé y Medán.—p. 691.

When Does Parenchymatous Syphilis Develop?—Calicó uses the term parenchymatous syphilis as the common denominator for tabes, general paresis, and neurosyphilis of different kinds. He analyzes five cases to show that this parenchymatous involvement occurs much earlier than hitherto supposed. In these cases the interval between the contracting of the disease and the first manifestations of the neurosyphilis was three years in the untreated cases; three years in one case treated vigorously and systematically, and thirty-two years in another case treated periodically quite vigorously. He remarks that this diversity of development with and without treatment, all in robust men with a sound constitution otherwise, shows that there is some unknown factor that still eludes us.

Semana Médica, Buenos Aires

Feb. 2, 1922, **1**, No. 5

*Surgery of the Stomach. A. Gutiérrez.—p. 157.
Case of Bilharziasis of the Bladder. M. Barros.—p. 165.
Syphilitic Parotitis in Adolescent. J. P. Garrahan.—p. 172.
Oscillographic Sphygmomanometer. M. Breyter.—p. 174.
Serotherapy of Snake Bite. R. V. Iglesia.—p. 178.

Surgery of the Stomach.—Gutiérrez gives twenty-six illustrations to show the present trend of operations on the stomach in different countries.

Feb. 9, 1922, **1**, No. 6

*Tibiotarsal Arthrodesis. C. Pasquini López.—p. 201.
Banti's Disease. I. Allende.—p. 220.
Medical Impressions of South America. W. Sharpe (New York).—p. 225.
Puerperal Eclampsia. M. Ruibal Salaberry.—p. 228.
Pinguecula and Pterygium. R. Argañaraz.—p. 230.

Tibiotarsal Arthrodesis.—Pasquini gives a summary review of a year's work in the surgical service, describing with seven illustrations, among other things, the technic applied for tibiotarsal arthrodesis. Some of the twenty illustrations show the methods and success with pes equinus and varus, etc.

Siglo Médico, Madrid

Feb. 18, 1922, **69**, No. 3558

*Function of Corpus Callosum. G. R. Lafora and M. Prados.—p. 169.
Melanic Epithelioma of the Conjunctiva. C. Jiménez López, V. Ribón and A. Peña Chavarría.—p. 174.
*Familial Paranoia. Salas y Vaca.—p. 176.
Chlorination of Water. J. Race.—p. 178.

Function of the Corpus Callosum.—Lafora and Prados have continued their research in this line on monkeys and cats since their publication in 1919. Their illustrations aim to give an idea of the motor and other symptoms that follow slitting the corpus callosum for more or less of its entire

length. (Their research was described more fully in the Madrid Letter, April 22, p. 1214.)

Familial Paranoia.—Salas refers to mental aberration which takes the form of imagined persecution by some member of the family. He is director of the state asylum, and states that such cases are comparatively common. In the asylum during months and years the patients had seemed absolutely rational and kindly, but on return to the family their persecution delusion proved to be as vivid as ever. This form of paranoia is not only difficult to class, but peculiarly liable to entail tragedies.

Feb. 25, 1922, **69**, No. 3559

Exercising a Joint After Resection. J. Blanc Fortacin.—p. 197.
Treatment of Hemiplegia After Injury of the Brain. J. Blanc Fortacin. —p. 198.
*Hysteric Amaurosis. M. Marin Amat.—p. 199.
Present Status of Meningitis. Suñer.—p. 202. Conc'n No. 3560, p. 231.
Gangrenous Ecthyma in Child of 2. Sicilia.—p. 206.

Hysteric Amaurosis.—In Marin Amat's case the woman of 26 was robust and free from pathologic antecedents, except influenzá two years before. After a sudden, six-day attack of intense continuous pain in the left side of the head, with vomiting, total blindness in the left eye developed, plus blepharospasm. The subsidence of all the disturbances under treatment on a base of suggestion demonstrated their hysteric origin. It is important, he adds, in treating the hysteric not to inform the patient or the family in regard to the hysteric nature of the disturbances.

Archiv für Kinderheilkunde, Stuttgart

March 11, 1922, **71**, No. 2

Action of Homatropin on Infant Eye. G. Richter.—p. 81.
*Protein Therapy of Anemia in Young Children. H. Behrendt.—p. 94.
*Winckel's Disease in the New-Born. H. E. Anders and G. Stern. —p. 101.
Capacity for Lactation. Ida Winternitz.—p. 109.
History of Rachitis in Folklore. M. Cohn.—p. 123.

Protein Treatment of Anemia in Children.—Behrendt gave a daily intramuscular injection of 1 c.c. of horse serum or of some antiserum as shock treatment of severe anemia in 5 young children, 4 less than a year old. The effect of this serum protein therapy, he says, was remarkable—*ganz erstaunlich*. The hemoglobin rose from 17 to 63 per cent. under 21 injections in one 5 months female infant, and the erythrocytes from 880,000 to 2,400,000. In one 11 months male infant, under 45 injections, the hemoglobin increased from 35 to 60 and the erythrocytes from 3,500,000 to 6,400,000. No anaphylactic phenomena were observed in any instance. In 2 other infants the protein therapy induced notable improvement in the general health, but the blood picture did not improve to correspond. He suggests that the response to protein therapy in anemia in children may classify anemia in two groups which may throw more light on its nature. The benefit in the first group of 5 cases was so positive and astonishing that this treatment will have to be given a trial in all cases of anemia in young children.

Winckel's Disease in Young Infants.—In the case here reported the child, 1 week old, seemed to be suffering from poisoning, but necropsy revealed sepsis from hemolytic streptococci. There was nothing to suggest inherited syphilis.

Deutsche medizinische Wochenschrift, Berlin

Feb. 2, 1922, **48**, No. 5

Treatment of Malignant Tumors. Sauerbruch and Lebsche.—p. 149. Conc'n.
The Limits of Local Anesthesia in Surgery. Braun.—p. 151.
*Extirpation of Suprarenals in Epilepsy. G. Sultan.—p. 153.
Action of Intravenous Injections of Camphorated Oil. Leo.—p. 155.
Treatment of Acute Anemia during Labor. E. Runge.—p. 156.
Soft Soap as Adjuvant in Syphilis. Hübner.—p. 157.
Treatment of Lacrimal Glands with Roentgen Rays. L. Brandt and M. Fraenkel.—p. 159.
Technic of Quartz Lamp Treatment. F. M. Meyer.—p. 160.
Promotion of Hair Growth by the Zuntz and the Kapp Methods. Apel. —p. 161.
Therapeutic Value of Petrolatum. Möller.—p. 161.
Diseases of the Pancreas. G. Singer.—p. 162. Cont'd.
Inflammatory Affections of Female Genitalia. Liepman.—p. 164. Cont'n.

Extirpation of the Suprarenals in Epilepsy.—On the basis of personal experience in five cases in which he operated and the reports of the experiences of others, Sultan gives his opinion that the number of patients is still too small to pronounce a final judgment on the procedure, but that the prospects of effecting a cure or even any considerable improvement in epilepsy by removal of the suprarenals must be regarded as slight.

Medizinische Klinik, Berlin

Feb. 19, 1922, **18**, No. 8

Arsphenamin Questions. Arndt.—p. 231. Cont'd.
Roentgen Findings with Disease of Pancreas. G. Herrnheiser.—p. 233.
Questionnaire on the New Influenza Epidemic.—p. 237.
Experiences with Surgical Tuberculosis. S. Romich.—p. 239.
*Thermometer Readings in Urine. Poelchau.—p. 240.
Technic for Deep Roentgen Therapy. F. Nagelschmidt.—p. 242.
*Flocculation of Plasma in Pulmonary Tuberculosis. A. Frisch and W. Starlinger.—p. 247.
Importance of Hydrotherapy and Thermotherapy in Certain Functional Nervous Affections. E. Tobias.—p. 249.

Thermometer Readings in Jet of Urine.—Poelchau suspends the thermometer in a little wire frame which is hung on the edge of the glass or other vessel or it can be held in the hand. The mercury bulb is brought close to the meatus so that the stream of urine laves it. His tests of this method have confirmed the reliability of the findings, he says, while the advantages of the method, the absence of danger of infection, the fact that the thermometer can be used from subject to subject, render the method particularly useful when numbers of persons have to be examined in the shortest space of time. He has found that 100 or 150 c.c. of urine is ample for the purpose for both males and females. The thermometer records the temperature about 0.2 of a degree lower than the rectal temperature; very seldom does the difference amount to 0.4 C.

Flocculation of the Blood Plasma in Tuberculosis.—Frisch and Starlinger estimate the fibrinogen content of the blood by mixing 0.2 c.c. of a 5 per cent. solution of sodium citrate with 0.8 c.c. of blood, and centrifuge or wait for spontaneous sedimentation. Then 0.2 c.c. of the citrated plasma is mixed with the same amount of a saturated sodium chlorid solution, and the flocculation that ensues in the next three minutes is recorded. In normal conditions a fibrinogen content of 0.2 per cent. is the rule. When 0.4 or more is found, and pregnancy and menstruation can be excluded, then something is wrong in the organism. If other signs point to tuberculosis, this intense flocculation is corroboratory evidence. It throws light on the activity and progressive nature of the tuberculous process, and is especially instructive when supplemented with the suspension stability test of the erythrocytes, which is likewise conditioned by the fibrinogen content of the blood. This, in turn, is the gage of the cell destruction going on, measured by the corresponding amount of albumin disintegration.

Münchener medizinische Wochenschrift, Munich

Feb. 10, 1922, **69**, No. 6

The Nomenclature of Tuberculosis. L. Aschoff.—p. 183.
Mode of Action of Protein Bodies and Irritants. Döllken.—p. 185.
Researches on Normal Constitution. J. Kaup.—p. 189.
The "Arm Tonus" Vestibular Reaction. Wodak and Fischer.—p. 193.
Vaccinotherapy. Hilgermann and Krantz.—p. 194.
Contents of Bullae in Specific Reactions. Thomas and Arnold.—p. 196.
Blood Platelets in the Sick and the Well. H. Zeller.—p. 197.
Active Treatment of Abortion. H. Saenger.—p. 198.
Familial Occurrence of Migraine. E. Ebstein.—p. 199.
Tuberculosis in Infants and Young Children. T. Köffler.—p. 200.
Intraperitoneal Infusion as a Last Resort in Severe Nutritional Disturbances of Infants. X. Mayer.—p. 201.
Thyroid Treatment of Chilblain and Chronic Frostbite. Embden.—p. 201.
The Sauerbruch Cineplastic Operations and Prosthesis. Blencke.—p. 202.
Iodism. O. Muck.—p. 203.
Prevention of Serum Sickness by Using Bovine Antiserums. R. Kraus. —p. 204.
Rachitic Involvement of Muscles. A. Müller.—p. 204.
Hemorrhage and Blood Conservation. J. Wieting.—p. 206.

Feb. 17, 1922, **69**, No. 7

*Roentgen Irradiation of Uterine Carcinoma. A. Döderlein.—p. 221.
The Question of Tuberculosis and Childbearing. Schweitzer.—p. 223.
Evacuation of Uterus in General Practice. Friedemann.—p. 226.
*Genealogic Investigations and Psychoses. C. von Economo.—p. 227.
Parenteral Nonspecific Protein Therapy. Stintzing.—p. 229.
Late Results of Cineplastic Amputations. C. ten Horn.—p. 230.
Modified Percutaneous Tuberculin Test. P. Widowitz.—p. 233.
Prevention of Disturbing Reflex Phenomena in Interventions on the Throat. O. Muck.—p. 234.

Psychogenic Suppression of Bárány's Symptom. Griessmann.—p. 234.
An Aid in Testing the Romberg Symptom. H. Goldblatt.—p. 235.
Treatment of Biermer's Anemia. A. Adler.—p. 236.
Temporary and Final Hemostasis. J. Wieting.—p. 236.
The Extrapyramidal Syndrome. E. A. Grünewald.—p. 238.

Roentgen Irradiation of Carcinoma of the Cervix Uteri.—Döderlein began in 1913 to treat cancer of the uterus exclusively with radioactive metals—radium and mesothorium—and in recent years he has combined radium therapy with roentgenotherapy. He reports his results in the cases treated up to 1916, in which the cures date back at least five years. These are all cervix uteri cases. He divides his cases into four groups: (1) All cases that, after the first examination, were designated as operable and in which the same therapeutic results might possibly have been secured by operation; (2) borderline cases; (3) inoperable cases, in which, however, roentgen irradiation was undertaken in spite of the wide extension of the carcinoma, and (4) hopeless cases, in which for local and general reasons all treatment seemed useless. The first group comprises, from 1913-1916, 77 cases, in 37 of which, or 48 per cent., a cure was effected. In the second group there were 90 patients, 18 of whom, or 20 per cent., were cured. In the third group there were 214 cases, in 13 of which, or 6.07 per cent., recovery took place. Even in the fourth group of 119 supposedly hopeless cases one patient was cured. The 32 recoveries among the inoperable cases constitute, Döderlein thinks, just so many more lives saved than would have been saved if the sole dependence had been placed on surgery. While he finds these results satisfactory, in one sense, he regrets that so many patients failed to keep up the treatment; otherwise the proportion of cures would have been greater. Especially during the years of the war, patients were, for various reasons, inclined to neglect their treatment. Herein lies, it is true, one advantage that surgery has over radiotherapy, since the principal treatment is given at one sitting. Of 43 patients of the first group that kept up the treatment, 35, or 81 per cent., were cured.

Value of Genealogic Investigations in the Classification of Psychoses.—Economo has found the study of genealogies valuable in arriving at a classification of psychoses. As a result of such investigations he found that scarcely a third of the children of paranoiacs are mentally sound. A large portion (from a fourth to a third) suffer from pronounced mental disease; more particularly, dementia praecox. All the rest have a psychopathic tendency. Of 22 children, 7 were mentally sound, 6 were mentally unsound, and 9 presented "schizoid" manifestations.

Wiener klinische Wochenschrift, Vienna

Feb. 2, 1922, **35**, No. 5

Cancer Research. A. Fraenkel.—p. 97. Conc'n No. 6, p. 132.
Peculiar Course of Tuberculous Spondylitis. H. Wimberger.—p. 102.
Syphilitic Leukoderma in Relation to the Bloch Dioxyphenylalanin Reaction. E. Gold and F. Reiss.—p. 103.
Chronic Intestinal Invagination plus Appendicitis. E. Frommer.—p. 105.
Diagnosis of Tuberculosis of the Intestine. A. Kirch.—p. 106.
Intermittent Claudication Due to Cardiac Hypoplasia. Serko.—p. 106.
Cardia Changes in Esophageal Processes. T. Bársony.—p. 106.

Feb. 9, 1922, **35**, No. 6

Analysis of Replies to Questionnaire on Cancer Sent Out by the Austrian Society for Cancer Research. Peller.—p. 121. Conc'n No. 8.
*Hemolysins After Splenectomy. S. Weiss and E. Stern.—p. 127.
Elimination by Gastric Juice and Bile of Parenterally Incorporated Stain. P. Saxl and D. Scherf.—p. 128.
Lung Abscess Following Thorax Injury. H. Hoffmann.—p. 129.
*Bilateral Temperature Record in Disease. J. Pok.—p. 130.
Modification of the Neisser Syringe. E. Lekisch.—p. 131.
Present Status of Cancer Research. A. Fraenkel.—p. 132. Conc'n.

Effect of Extirpation of the Spleen on Formation of Hemolysin.—Weiss and Stern found in experiments on rabbits that the formation of hemolysin in animals is unfavorably influenced by the extirpation of the spleen. It cannot be asserted that the spleen is the only organ having to do with the formation of hemolysin, but from their researches they are convinced that the spleen is at least an important factor in the production of this antibody.

Value of Bilateral Determination of Body Temperature for Differential Diagnosis of Febrile Conditions.—Observations in a series of febrile, gynecologic affections led Pok to note that bilateral determination of body temperature sometimes shows considerable variation; for example, in infectious diseases. According to the position of the diseased organ, one or the other side of the body will present a constantly higher temperature, the side in which the infection is located being slightly higher. Axillary temperatures were usually taken.

Zeitschrift für urologische Chirurgie, Berlin

March 6, 1922, **8**, No. 6

*Dividing a Single Kidney. G. van Houtum.—p. 165.
*Dividing a Single Kidney. S. B. de Groot.—p. 170.
*Nephrostomy for Acute Anuria. K. Haslinger.—p. 172.
*Experimental Cystectomy. E. A. Delfino.—p. 177.
*Paranephritic Suppuration. H. Boeminghaus.—p. 180.
*The Abdominal Fissure Question. G. B. Gruber and E. Best.—p. 190.
*Diagnosis of Abscess in Kidney. F. Necker.—p. 204.

Dividing a Horseshoe Kidney.—Van Houtum has found only three cases on record in which the pains from traction on the single kidney were cured at once by slitting the kidney in two. Two of the three cases were reported by Brongersma, the other by Rovsing. Van Houtum adds another case to the list, but says that the relief from the pains was slow and gradual, the cure not being complete until a year and a half had elapsed. He diagnosed the condition by pyelography, controlled by palpation under general anesthesia, and confirmed by the operation on the woman of 37. She had been having attacks of pain in abdomen and back at intervals during the last eighteen months, and each attack terminated in hematuria. The first symptoms developed the night after a tennis match, and the attacks returned after violent exercise afterward. There was considerable hemorrhage as the kidney was divided. At present, two years since the operation, she is free from all disturbances and plays tennis regularly.

The similar case reported by de Groot was in a boy of 16 who had complained of abdominal pains for two years. They occurred only when he reclined or sat with the spine stretched. The central portion of the single kidney was divided through a median incision, the patient in the Trendelenburg position. The two halves slid into their normal beds but hung vertical. All disturbances ceased at once.

Nephrostomy with Acute Retention of Urine.—Haslinger credits the operation with the saving of the patient's life, although she succumbed not long after to the progress of her pulmonary tuberculosis. The right kidney had long been totally obstructed by a tumor when the functioning of the left kidney became defective. After a month of uremia and two days of anuria, the nephrostomy restored the urine function.

Experimental Cystectomy.—Delfino resected different parts of the kidney wall and was surprised at the excellent results of partial cystectomy with implantation of the ureters in the urethra. He made no attempt to suture the bladder stump or to protect the opening into the urethra, but the peritoneum had been sutured completely first. By this ureter-urethra technic, the normal course of the urine is preserved, and there are none of the dangers of methods of implanting the ureters at other points in the body.

Paranephritic Abscess.—Boeminghaus expatiates on the instructive findings in his fifty-two cases of paranephritic abscess when the urine from each kidney was collected separately.

A Sirenomelus.—Congenital abdominal fissure, vesicorectal cloaca, and rachischisis were among the complications in the monster with fused legs and no feet here described.

Early Symptom of Abscess in Kidney Cortex.—Necker calls attention to serous perinephritis as an early symptom of suppuration in the kidney cortex. He merely decapsulated the kidney and punctured it at various points after discovery of the serous perinephritis in a case described. No pus was found, and the operation gave only scant relief. He exposed the kidney a second time three weeks later, and this time discovered the abscess, and conditions slowly returned to clinically normal thereafter. If he had recognized at the first operation that the serous perinephritis was a sign of an abscess in the cortex, much suffering and time would have been saved.

Zeitschrift für Urologie, Leipzig

1922, **16**, No. 1

Melanosarcoma of Penis in Man of 72. W. Peters.—p. 1.
*Aseptic Catheterization of the Ureter. M. Klika.—p. 4.
Shape of Bladder Varies with Position. T. Hryntschak and M. Sgalitzer.—p. 11.
Bilharziasis of the Scrotum. E. Pfister.—p. 16.
Modification of Urethroscope. A. Cassuto.—p. 19.

Aseptic Catheterization of Ureter with Infected Bladder.—Klika thinks he has solved this problem to a certain extent by the use of two catheters, a No. 7 and No. 4. The No. 7 is prepared by dipping the bladder end in a thick mucilage until a fine membrane forms over the openings, closing them completely. The No. 4, with metal guide inside, is then introduced into the No. 7, the tip reaching not quite to the tip of the No. 7. The tip of No. 7 is then introduced into the mouth of the ureter where it is held firm while the inner catheter is pushed through the membrane in the tip of No. 7. The guide is then withdrawn,and the fine catheter is worked on up to the pelvis as usual. It has not come in contact at any point with the bladder contents.

Zentralblatt für Chirurgie, Leipzig

Jan. 7, 1922, **49**, No. 1

A Germ-Free, Colloidal Pepsin Solution for the Softening of Scars, and the Prevention and Loosening of Adhesions. E. Payr.—p. 2.
The Incision for Brauer's Cardiolysis. E. Melchior.—p. 12.
Regenerative Capacity of the Colon. A. H. Hofmann.—p. 13.
Rupture of Thumb Tendon (Drummer's Paralysis). W. Levy.—p. 15.
Addendum to "An Unusually Large Free Body in a Hydrocele of Testicle." The Question of Its Origin. E. Glass.—p. 18.

Zentralblatt für Gynäkologie, Leipzig

Jan. 7, 1922, **46**, No. 1

Adenoma of Corpus Uteri in Elderly Women. C. Menge.—p. 1.
*Expectant Treatment of Eclampsia. F. Lichtenstein.—p. 5.
*Operations on the Pregnant Uterus. H. Küster.—p. 35.
Modified Method of Intra-Uterine Radium Treatment. Flatau.—p. 36.
A Simple Method of Measuring the Female Pelvis. Färber.—p. 37.

Ten Years of Obstetric Expectant Treatment of Eclampsia.—Lichtenstein emphasizes his satisfaction with his long experience with the waiting policy, and declares that the mortality for mothers and children has been reduced thereby one half. The physician who is dependent on his own resources can treat eclampsia much better thus than with extensive operations. His article is based on eighty cases of eclampsia before delivery, 175 intrapartum and sixty-two postpartum. The mortality in these three groups was respectively, 5 per cent., 11.4 and 4.8 per cent. There were preexisting complications in twenty-five of the women. He tabulates the details of the twenty-seven fatal cases.

Operations on Gravid Uterus.—Küster reports that by injecting a procain-epinephrin solution into the edges of the incision of the cervix, he was able to carry through a plastic operation on the gravid uterus without disturbing the pregnancy. The local anesthesia prevented the shock to the musculature or reflex action, and the reduction of bleeding by the epinephrin was a welcome by-effect.

Zentralblatt für innere Medizin, Leipzig

Jan. 7, 1922, **43**, No. 1

Vasoconstrictive Substances in the Blood with High Blood Pressure. W. Hülse.—p. 1.

Tohoku Journal of Experimental Medicine, Tokyo

Jan. 30, 1922, **2**, No. 5-6. German and English Edition

*Research on Whales. S. Oiakawa.—p. 447, etc. Idem. M. Takata.—p. 459.
*Research on the Lymph. S. Osato.—p. 465, etc.
Hyperglycemia and Glycosuria in Rabbits Fastened to the Research Table. I. Fujii.—p. 531.
*The Blood Sugar Content of the Heat-Punctured Rabbit. S. Morita and M. Naito.—p. 562.
*Acidosis in Experimental Ileus. T. Odaira.—p. 570.

Research on Whales.—The four communications here bring to seven the series of reports on scientific research on cetaceans. Oikawa's are devoted to analysis of the keratin and gelatin of certain whales and the use of their bacon-like fat for food. Takata discusses the amniotic fluid.

Research on the Lymph.—Osato has been studying the passage into the lymph of various substances injected into the blood. Also the sugar-producing ferments and the sugar content of the lymph. Also the ferments in the lymph and their connection with the pancreatic ferments. His conclusions are presented in three separate articles.

Blood Sugar Content of Heat Punctured Rabbit.—This article is in English. Neither hyperglycemia nor glycosuria could be detected in the rabbits although their temperature ran up to 40.3 and 41.4 C. (over 106 F.) after the heat puncture.

Treatment of Acidosis in Experimental Ileus.—This article also is in English. The full title is "Changes in the Oxygen Combining Power of the Blood (Acidosis) in Experimental Obstruction of Intestines and the Effect of Some Treatments on Them." One practical conclusion of the extensive research is that acidosis develops as a consequence of obstruction of the bowel, and that this acidosis yields to sodium bicarbonate, the general symptoms showing marked improvement. This testifies that the acidosis with intestinal obstruction is more or less responsible for the general symptoms. The successful injection of bicarbonate was often followed by conspicuous diuresis. Large doses of the bicarbonate were necessary. Injection of saline does not modify the acidosis in the same way as the hydrogen ion content of the blood is lowered by the alkaline. Hence the effect of the latter cannot be due mainly to the dilution of poisonous products in the blood. Calcium chlorid injections by the vein aggravated instead of improving the general symptoms.

Hospitalstidende, Copenhagen

Feb. 1, 1922, **65**, No. 5

*Erythrogonia in Pernicious Anemia. V. Ellermann.—p. 65.
*Differentiation of Bacilli of Typhoid Group. S. V. Bagger.—p. 71. Conc'n in No. 6.

Feb. 15, 1922, **65**, No. 7

Influence of Exercise on Temperature. C. H. Würtzen and C. Holten.—p. 101. To be cont'd.

March 18, 1922, **65**, No. 8

Vaccine Therapy of Infection of Urinary Passages. O. Wulff.—p. 17. To be cont'd.

Rudimentary Erythrocytes in Pernicious Anemia.—Ellermann's photomicrograms from two cases confirm the presence in the blood in pernicious anemia of hemoglobin-free precursors of erythroblasts. Colonies of these extremely rudimentary cells were found also in spleen and liver.

Differentiation of Typhoid Bacteria.—Bagger has been trying the filter paper method of differentiating typhoid bacilli. Strips of filter paper are hung in the fluid under examination, and the bacteria of the typhoid group climb up in the paper faster and more abundantly than other bacteria.

Hygiea, Stockholm

Jan. 31, 1922, **84**, No. 2

*High Blood Pressure and Diabetes. E. Kylin.—p. 49.

High Blood Pressure and Diabetes.—Kylin has been continuing his research on high arterial blood pressure without high capillary pressure. In this form, the blood pressure fluctuates readily within a wide range, and it may drop to normal during sleep. This instability of the arterial pressure testifies that the high blood pressure is not due to organic changes in the vessel walls. It is much more probable that the fluctuations are due to some chemical influence, possibly some internal secretion. In a very large proportion of his ninety-seven cases of diabetes since 1919 there was high blood pressure of this purely arterial, unstable type. He argues that both the high blood pressure and the diabetes are the result of one and the same cause, responsible also for the accompanying lymphocytosis, low tolerance for carbohydrates, and the vasomotor instability. The still unknown cause, the morbus *x*, opens a field for research on its etiology, symptomatology, prognosis and treatment. The instability of the blood pressure during the menopause period suggests that insufficiency of the sexual glands may be incriminated. Men with this purely arterial high blood pressure often complain of loss of sexual vigor, even men of 40 or 50.